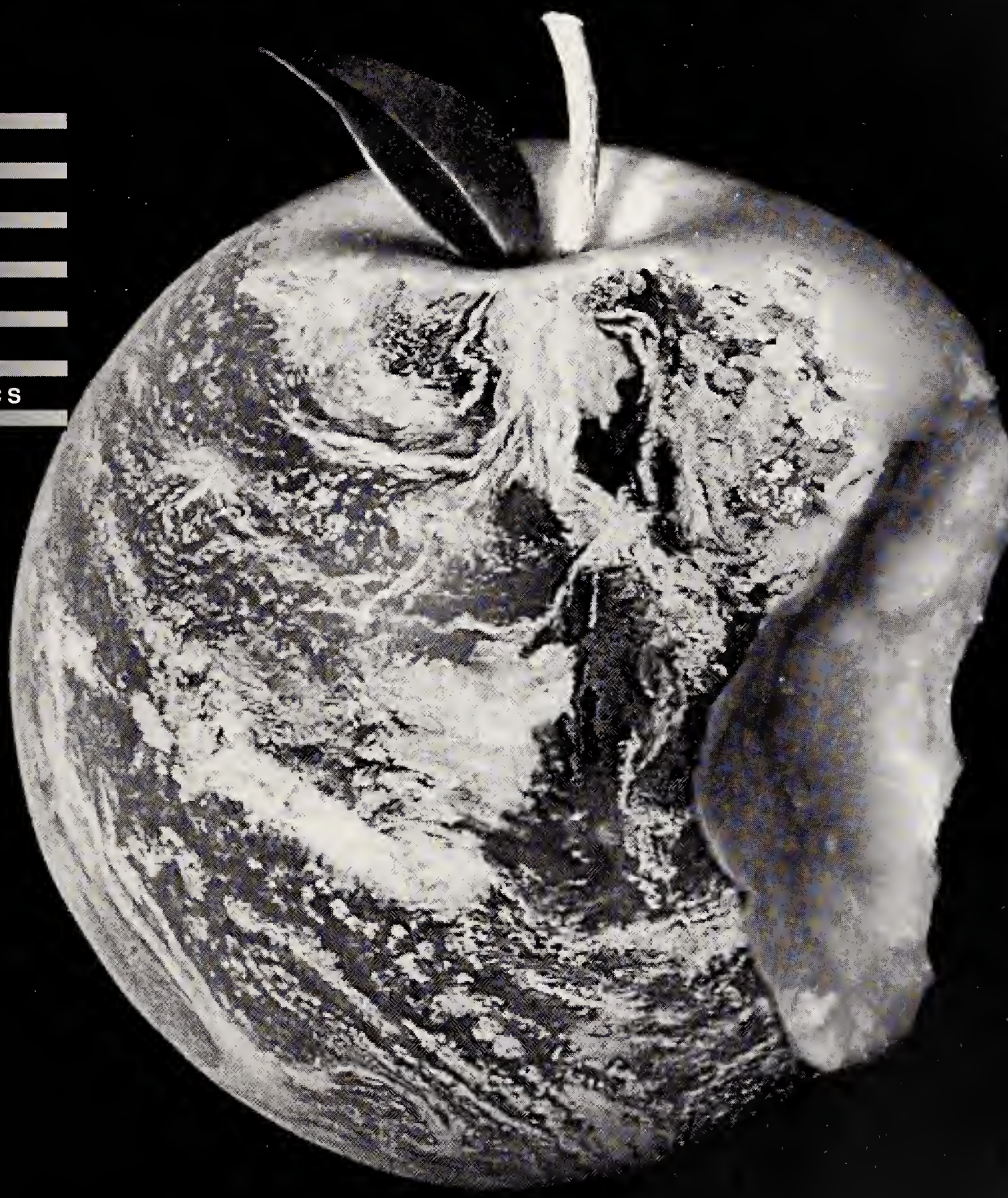
Verbum

VERBUM
1.3
JOURNAL
OF
PERSONAL
COMPUTER
AESTHETICS



HIGHER VISIONS, HIGHER RES
FIRST LADIES OF DIGITAL ART
April Greiman
Dominique de Bardoneche Berglund
DESKTOP VIDEO

TOOLS OF THE REVOLUTION
Object-Oriented Programs Compared
ImageStudio and Gray-Scale Magic
First Contact: Adobe Illustrator
THE HOME MUSIC STUDIO

"Draw it again, Sam..."

Here's looking at . . .

Introducing "Draw It Again, Sam,"™ the newest drawing program for Macintosh!™ With powerful extended features, it adds new dimensions to your Mac graphics.

If you have used MacDraw™ or MacDraft!™ you've felt the power that a drawing program can put in your grasp. Imagine the same power brought to an even higher level, with features like libraries, layers, color, advanced text features, and a wide array of graphic display modes. . . Imagine "Draw It Again, Sam."

Libraries Were Never This Much Fun

Only "Draw It Again, Sam" lets you create your own graphics and text libraries. Create any image, simple or complex, and copy it into a library. Click on an icon-like symbol or on the image's name in a menu, and place the image anywhere on any drawing. Store and retrieve frequently used images, text, or logos, building large libraries (up to 500 images) for drafting, designing, or just for fun. No more rooting through scrapbook files, no more wrestling with the clipboard, and no more wasted time!

Create a Masterpiece —Layer by Layer

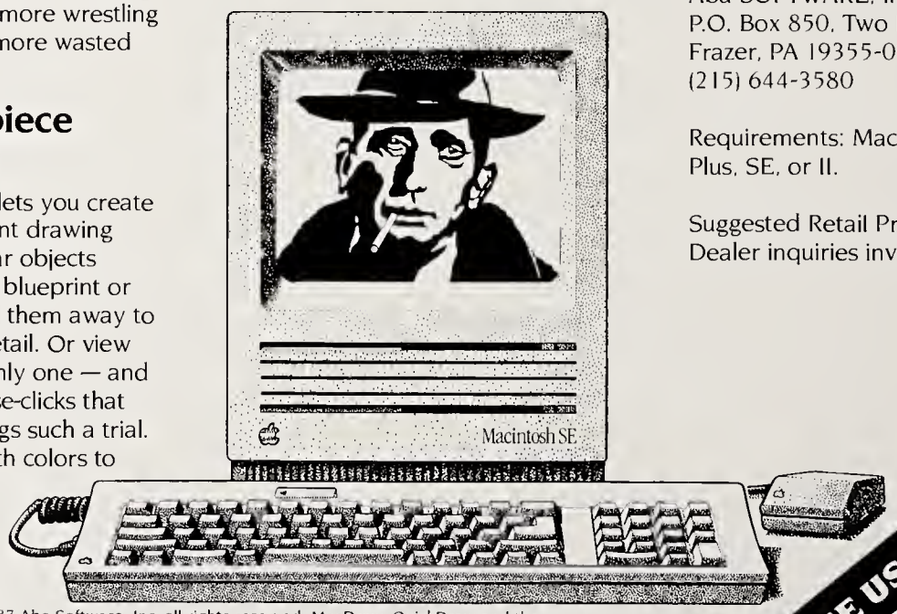
Only "Draw It Again, Sam" lets you create and use up to ten transparent drawing planes. You can group similar objects together, as an architectural blueprint or an anatomical drawing. Peel them away to reveal layer after layer of detail. Or view them all while working on only one — and avoid those accidental mouse-clicks that make doing detailed drawings such a trial. Use layers in conjunction with colors to produce spot color separations with ease or extend a single drawing into an animated series. You can even import a drawing and work over it or behind it without touching the original. Save or print the drawing layer-by-layer or as a whole. The possibilities are endless!

Amazing Graphic Flexibility Is Yours

"Draw It Again, Sam" uses the Macintosh's drawing modes to their fullest potential. Your objects can be in opaque, inverted, clear, or erased modes. You can experiment with overlaying transparent colors and patterns, you can even extend your drawing skills beyond the basics and generate an endless set of special effects. The countless colors and shapes achieved by this program are breathtaking.

To Paint or Not to Paint

Version 2.0 of "Draw It Again, Sam" adds a full set of painting tools to the drawing ones. Now you can combine the fine detail of bit-mapped graphics with the flexibility and ease of object-oriented drawing. And you can use both paint and drawing tools on the same layer — either side by side or overlapping. The best part is, "Draw It Again, Sam" is compatible with other paint, draw and page layout programs, allowing you to import and export art forms.



You Must Remember This . . .

With its comprehensive set of features and ease of use, this program is one you have to get your hands on. To find out more, or to order your copy, call (215) 644–3580 and say, "Draw It Again, Sam."

Call or write:

ABA SOFTWARE

Aba SOFTWARE, Inc.
P.O. Box 850, Two Davis Avenue
Frazer, PA 19355-0915
(215) 644-3580

Requirements: Macintosh™ 512E, Plus, SE, or II.

Suggested Retail Price: $150
Dealer inquiries invited.

SEE US AT BOOTH #231 MACWORLD EXPO SAN FRANCISCO

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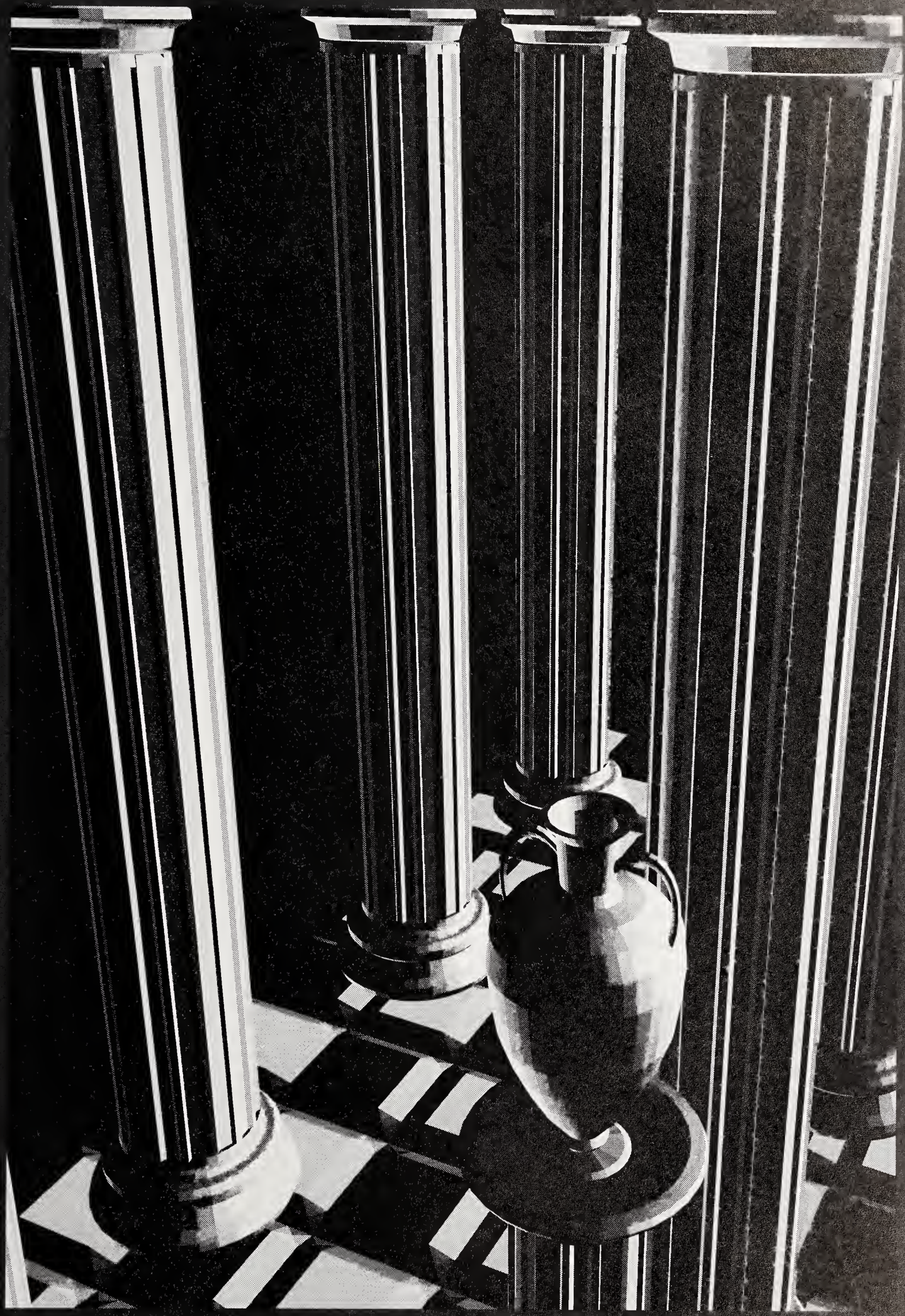

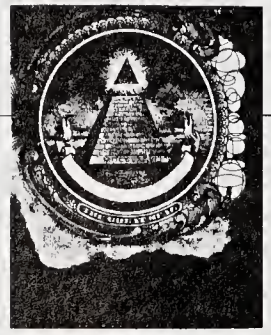

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SUBMISSIONS
For information on how and what to submit and where to send it, see page 56.

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European Editor

Tony Smith
Contributing Editor (Australia)

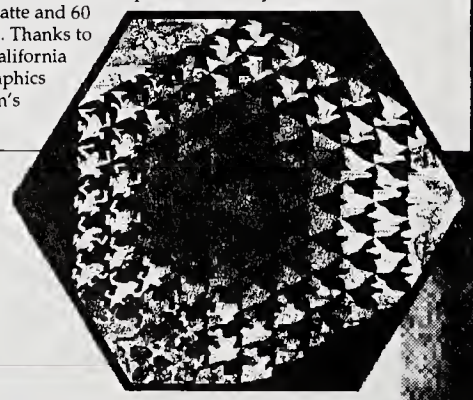
Cover Art This issue's masthead type was rendered by Ed Roxburgh in light brown ink (for a textured look) then scanned at 300 dpi on a Microtek MS-300A scanner. It was then cleaned up and adjusted for optimum contrast and brightness using Letraset's ImageStudio program on the Mac.

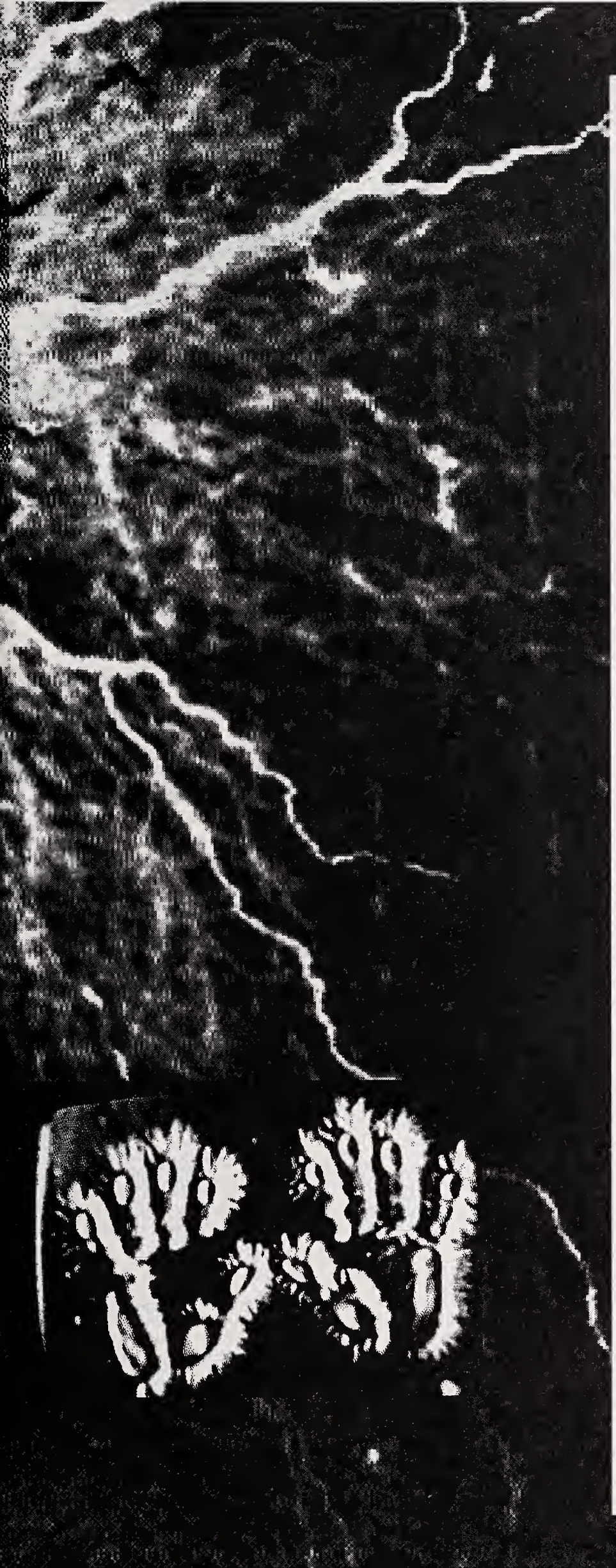
The Earth Apple was created by Jack Davis by scanning separate images of an apple and the Earth on Microtek's new MSF-300G flatbed scanner at 300 dpi and 256 shades of gray. The two images were combined in ImageStudio (at 64 shades of gray, the program's limit). Craig McClain photographed the apple.

The cover was printed as a negative (to maintain proper contrast of the gray-scale TIFF files) on an Allied Linotronic L-300 at 2540 dpi.

Frontispiece "Temple Scene" was created by Jack Davis with Enabling Technologies' Pro 3D program on a Mac Plus. It was output at 1270 dpi on the Lino.

Verbum 1.3 Production Notes This issue of *Verbum* was produced with Aldus' PageMaker 2.0 on a Macintosh Plus and an SE. Proofs were done on the Apple LaserWriter and AST TurboLaser (what a machine)! Final output was generated on a Linotronic L-300 at 1270 dpi. In a few cases, images were printed as negatives to avoid contrast problems that occur when detailed gray scale images are printed on the resin paper that's optimized for high-contrast, crisp black (type) on white. (Not realizing this at the time, we agonized for hours on the cover of 1.2, changing the contrast settings in Realist/ImageStudio and printing out version after 30-minute version on resin paper.) Verbum 1.3 was printed offset by National Press of Palo Alto, California on 60 lb. Sequoia Matte and 60 lb. Productolith Gloss for the color pages. Thanks to Multimedia Technologies of Carlsbad, California for Linotronic output, and to Central Graphics of San Diego for Lino negs on John Odam's "modern art" color seps.





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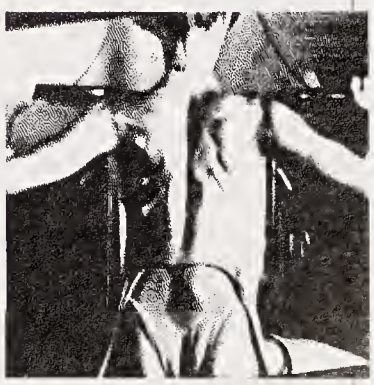


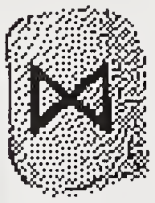
I N T R O

The number 3. At once cosmic and grounded. Implying the infinite, yet elegantly self-contained, finite.

Welcome to *Verbum 1.3*. A milestone issue. A gateway through which we enter – the mainstream. Personal computer art has reached the plateau upon which will be built a new kind of graphic design process. Not only are the graphic design and printing crafts benefiting from these revolutionary tools, but so too illustration, photography, music composition and performance, video production, and new forms of expression.

Along with other publications and industry spokespersons, *Verbum* has been heralding the new renaissance of personal computer creativity since 1986. But more than most, we have experienced firsthand, in producing the magazine and in our interactions with pioneering artists, the frustrations and limits of the early desktop systems. Only now do the hardware platforms give us adequate resources and expandability at an affordable price. Only now are programs available to create finished high-resolution illustrations, high-quality type, halftones, and mechanical color separations that meet (and often surpass) professional design standards. And only now are we seeing the breakthroughs in output: better-quality laser printers at less cost, widely accessible high-resolution image-setting systems from several vendors, and reasonably priced ink jet and thermal transfer PostScript color printers. Personal computer art has come of age.

Verbum has been an oracle, in a sense, mirroring the soul of this "market"— the relatively few users around the world who have helped this maverick industry get beyond the hype and blue sky and vaporware and down to tangible results. And as stated above, only now has the market reached a point of critical mass, where larger numbers of artists will be retooling their studio environments to include pc systems. *Now* watch us. We'll be serving this fast expanding market in a fittingly more comprehensive and consistent manner. The time has come for *Verbum* to move out of the proverbial garage. We thank our early subscribers and advertisers for helping us to realize the vision. We look forward to working with you in a significantly broadened capacity this coming year.



1988 promises a great deal for the world of pc art. But what does the coming decade hold? For one thing, it holds an increasingly aesthetically satisfying personal computing experience for *all* users. Apple led the way with Macintosh, realizing in the design — from the case to the interface — that if people were going to be using these robot heads as regularly as they used typewriters and adding machines and telephones, it had better be an aesthetically pleasing, *personalized* experience. Anything less would mean a world of infoworkers locked into rigid, dehumanizing bondage with cold machines. Instead, the Mac was inherently friendly, and could be endlessly customized. The user could express herself by configuring her computer; creating her own original desktop, start-up screen, and sounds; designing macros; adding pull-down accessories and her favorite typefaces. The Mac made the *personal* aspect of computing a reality. And it's one of the reasons creative types have taken to it. The Mac has, thankfully, influenced the entire industry in this direction. In the same way that aesthetics and human feelings have become a major factor in the planning of space habitats, so have these factors become essential in the brave new world of personal computers.

So the aesthetic dimension of computers starts with the interface experience. It encompasses modes of expression afforded by the power of digital electronics, the subject matter of *Verbum:* desktop publishing and graphic design, video, music, and so on. But the not-too-distant future holds an even greater meaning for the aesthetics of personal computing. The digital channeling of mass media will give individuals unprecedented access to and control over publications, broadcasts, data bases, and communications of all kinds. Within this convergence of mass media and personalized media (or *"individualized media"* as MIT's Nicholas Negroponte calls it; see Stewart Brand's *The Media Lab – Inventing the Future at MIT),* the process of aesthetic discrimination will hold even greater significance. As well as a new personalized experience of the world through the pc/entertainment center/telephone media lens, new kinds of interactive art making will arise. People in different rooms or different countries will be able to collaborate in real time on a creative project, and the resultant work will reach its audience much more immediately. If it's a business presentation, it will appear in stereophonic, holographic glory in 20 meeting rooms. If it's a Soviet-American performance art piece (we're talking *glasnost* to the max here...), it will reach interested viewers much more efficiently than scattered cable TV programs. If it's a poetry or art journal, it will make its way into readers' hands with much less grief and delay than traditional small press book or magazine distribution would allow. Digital media will not only change the way individuals interact with the world, they will open incredible new opportunities for creative expression and communications among specialized groups.

In the 1990s, many more people will enjoy expressing themselves creatively. Not only in the way they write or paint or draw. But in the way they capture and edit material. In the way they relate with the world's cultural nervous system.

Back to the present, we're looking at early digital art. We're looking at Bezier curves. Gray scales. Color. We're dazed and confused. And we love it.

We want to hear from you. Give us your ideas on *Verbum's* evolution.
Send material. Keep us informed — and we'll inform you!

Michael Gosney
Editor and Publisher

Thrown for a Loupe

Dear Verbum Humans,
We would like to sample your rag. Enclosed is $7.00. Your cover looked great in *MacUser*, even reduced down to a square inch. I got out my lens loupe and scrutinized it with my bulging eye bulb. Can't wait!!!
Richard P. Hodges, President
Hodges Engineering
Lyons, Colorado

Physical High

Thank you for the fast processing of my order. Here's my check. I heard of Verbum through the July issue of *Macworld*. I think it will be a nice addition to other graphics-related magazines on the market; the quality of work and physical layout of the magazine are very high.

I would like to see some articles on architectural presentation drawings produced on computer systems.
Jon Childress Farmer
La Mesa, CA

Thanks for the kind comments. See this issue's coverage of object-oriented programs (MacDraft in particular), and watch future issues for more specific attention to renderings and architectural illustrations. — ed.

Love it — can 't wait to see more. . .
S. L. Rajnus
Malin, OR

#1.1 is great — top quality art and production.
Bill Schroeder
Santa Monica, CA

Impressed

I just started my subscription to your publication. The other week I received my first issue and I was very impressed! Thanks so much and I look forward to receiving future issues of *Verbum*.
Jim Castanzo
Don Bennett Adv., Inc.
Wilkes-Barre, PA

As a graphic designer, I find *Verbum* to be visually exciting. I look forward to future issues.
Dan Stalinsky
Bellaire, TX

Guarded Jealously

Recently glanced at your publication, but didn't have time to read much of it. The owner guarded it so jealously I could only jot down your address. The subscription forms had already been removed. Please forward information regarding subscription, as well as guidelines for contributions.
Paul Rounds Schlemer
Winter Springs, FL

Nice magazine. Good job all!
Richard Bruning
DC Comics
New York, NY

Good inspiration for my work. Do continue to explain how a work is produced, etc.

P.S. Where does the name *Verbum* come from?
Bryan G. Nelson
Minneapolis, MN

We 're certainly happy to see the phrase "good inspiration" coming back to us. That 's our reason for being. And we certainly will continue emphasizing the essential "how-to" editorial complement to the ongoing showcase of creative work. — "Verbum" was the title of an M.C. Escher piece showing creation's many forms emanating from the word at the center (reproduced on page 4 of issue 1.1). In Latin it means "word," implying action or creation. Since pc art starts with the word (read code) and since we're exploring a whole new type of creativity, and since we respect Escher, whose mind in many ways anticipated the computer's contribution to art-making, we chose it as our name. And anyway, it just sounds good. — ed.

Unimpressed

I am very disappointed with the format and graphics of your magazine.

I would suggest a little more white space in your page layouts and larger headlines. I think these would help the reader know when one article ends and the other begins. Currently it looks more like a report than a magazine.
Donna Harris
Silver Spring, MD

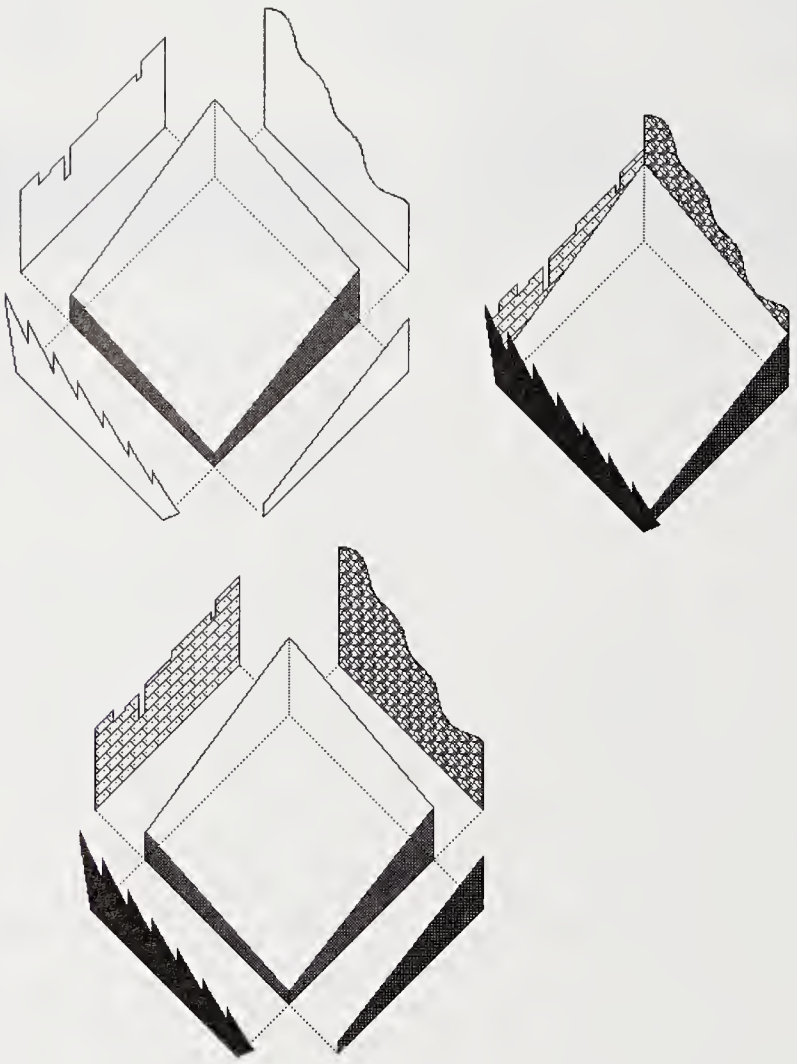
Dear Donna — We hope you will give us a chance, as we look at each issue as a new evolution. We're experimenting with our design and production as new tools become available and are showcasing the works of other experimenters.

And we do listen to all the feedback we can get. — ed.

Does Not Compute?

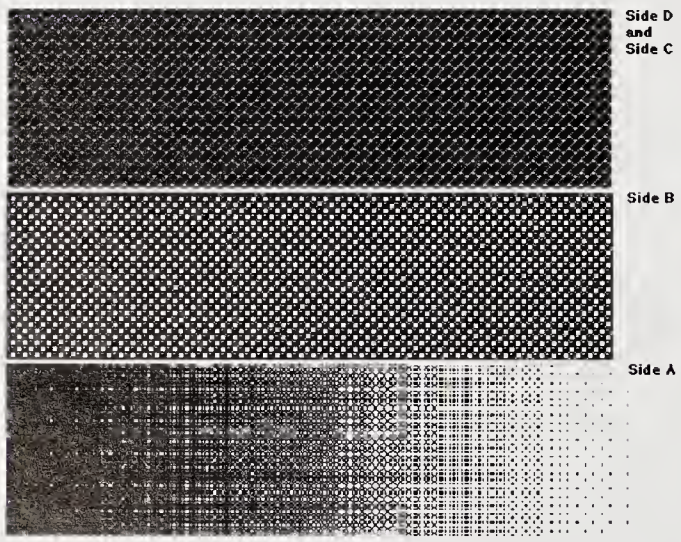
Needs to look more like it was done by designers/artists, and less like it was done by computer folks who think they're designers/artists. Publication design is good!
Bill Korbus
University of Texas
Dept. of Journalism
Austin, TX

Bill — to be honest, we're puzzled at this comment. It is in fact precisely our concern that there be a higher level of aesthetic sensibility and originality in the new world of desktop publishing and pc art. Far from computer folks who think they're designers/artists, Verbum people are typically artists who have only recently been exposed to computers. And our readers include a great many computer folks who, though they may not be artists themselves, know good work when they see it. Even John Dvorak. Care to send us some examples of real pc art by real artists?



Final Patterns for Side Panels

(pattern appears on both sides)

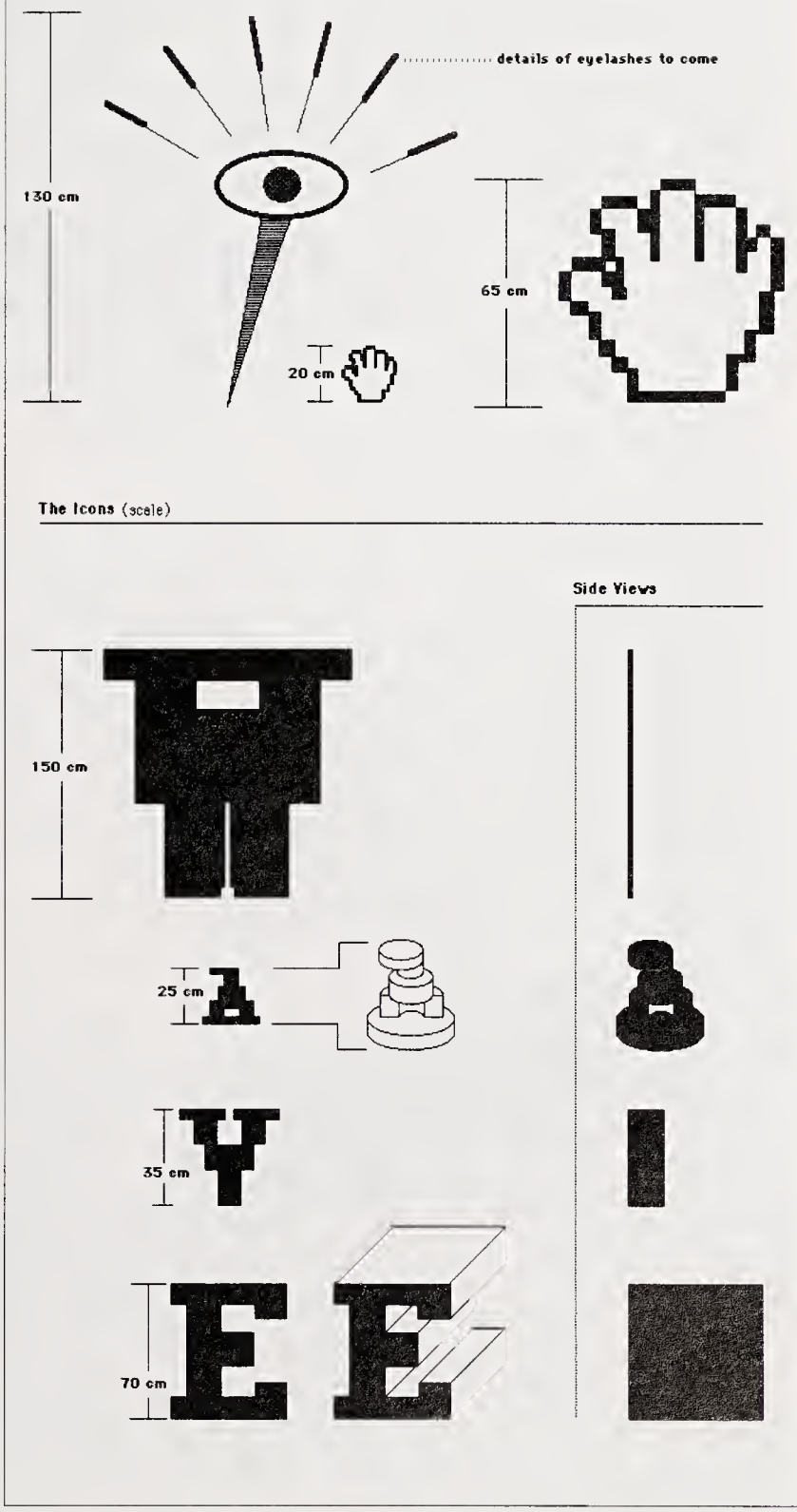


The platform is to be covered
with a synthetic lawn which we call Astro-turf . . .

it is incredibly bright green + some

Please use these patterns as final art work

Pacific Wave
Working Drawings



April Greiman, hailed as the "queen of L. A. design," elected to the prestigious Alliance Graphique Internationale, and a mover and shaker in the L. A. chapters of the American Institute of Graphic Arts and the Art Directors Club, is perhaps the best-known graphic designer to actively use the computer in her work. In her explorations of the graphic potential of computers, she pushes new wave design into the third dimension. She designed the sculpture shown in these three pages for Pacific Wave — California Graphic Design, an exhibition held in Venice, Italy from late September through November at the Museo Fortuny, which promotes graphic design and visual arts through shows and other events.

Included here are several of the MacDraw working documents for the sculpture, digitized shots of a prototype, a color photo of the sculpture on location in Venice, and a reproduction of the show poster Greiman designed. Her "Influences," written to introduce the Pacific Wave catalog, inventories some of the forces that inspire and shape the art processes of West Coast designers.

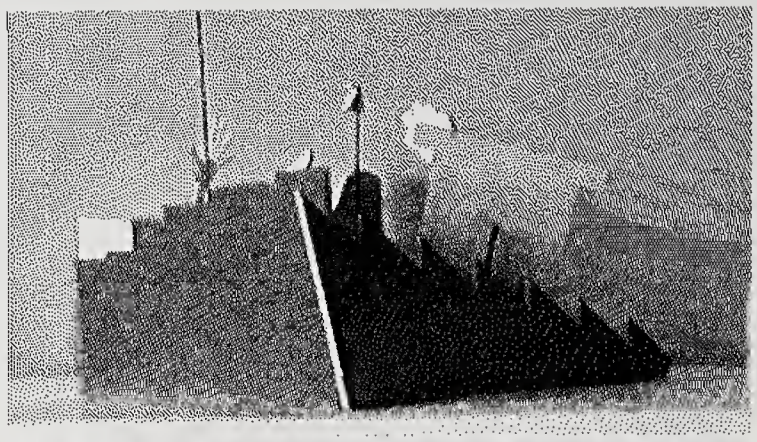
APRIL

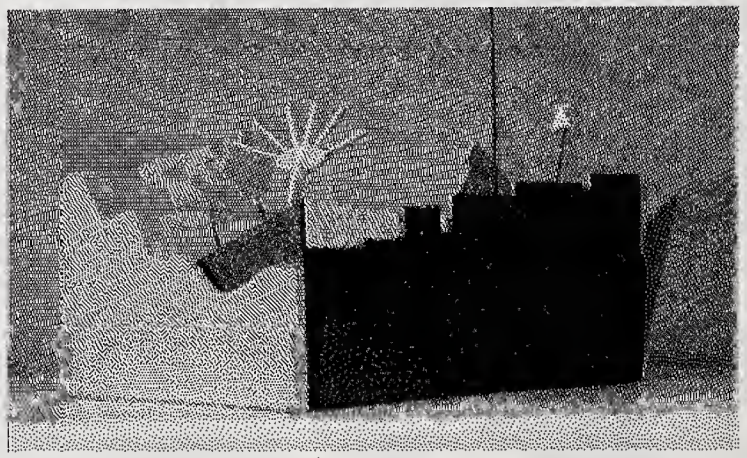
Pacific Wave Influences

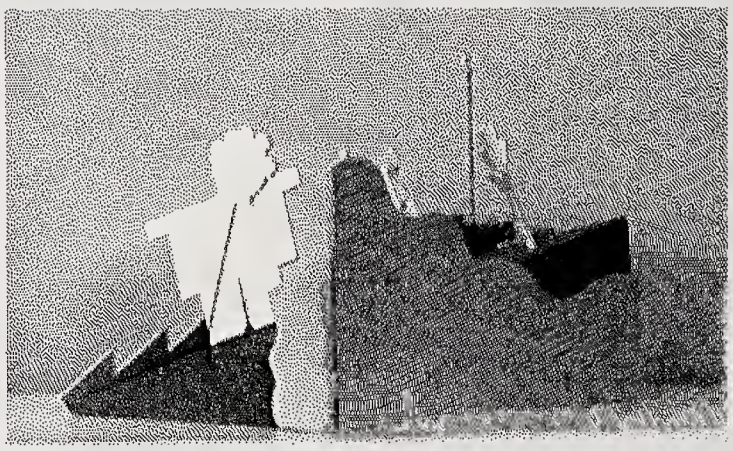
the strip, pacific coast highway, muscle beach, skinheads, shopping by car, zinfandel, chardonnay, ripple, wheatgrass juice, papaya shakes, chili dogs, bad coffee, counterculture, Esalen, Big Sur, Carmel, technology, entertainment, design, dayglo safety cones, women with teeth, men with no lips, surfers, the surf, 30 degrees of sun-block, tanning salons, health clubs, aerobics, nautilus, mickey mouse, tinkerbell, betty boop, madonna, dennis hopper, jack nicholson, tom cruise, pee wee herman, annie sprinkle, lizards + coyotes, twice-pipe chevys

the webbed feet, the west-side, the slippery, the waste, the swimming pools, the hot tubs, the jacuzzis, avocados, the fog, lack of seasons, horizontality, the myths, the legends, the hair-do mags, the hair salons, with valet parking, the acrylic nails, the convertibles, the futon couches, the mess, the smog, no air, the new museums, electronic architecture, billboards, goodyear blimps, Disneyland +, Universal, the sunset, Hollywood sign, the Observatory, the Hills, the female, the sun everyday, the warmth, the naiveté, the sparkle, the innocence, the sophistication, the youthfulness, Melrose, the cowboys, the cowgirls

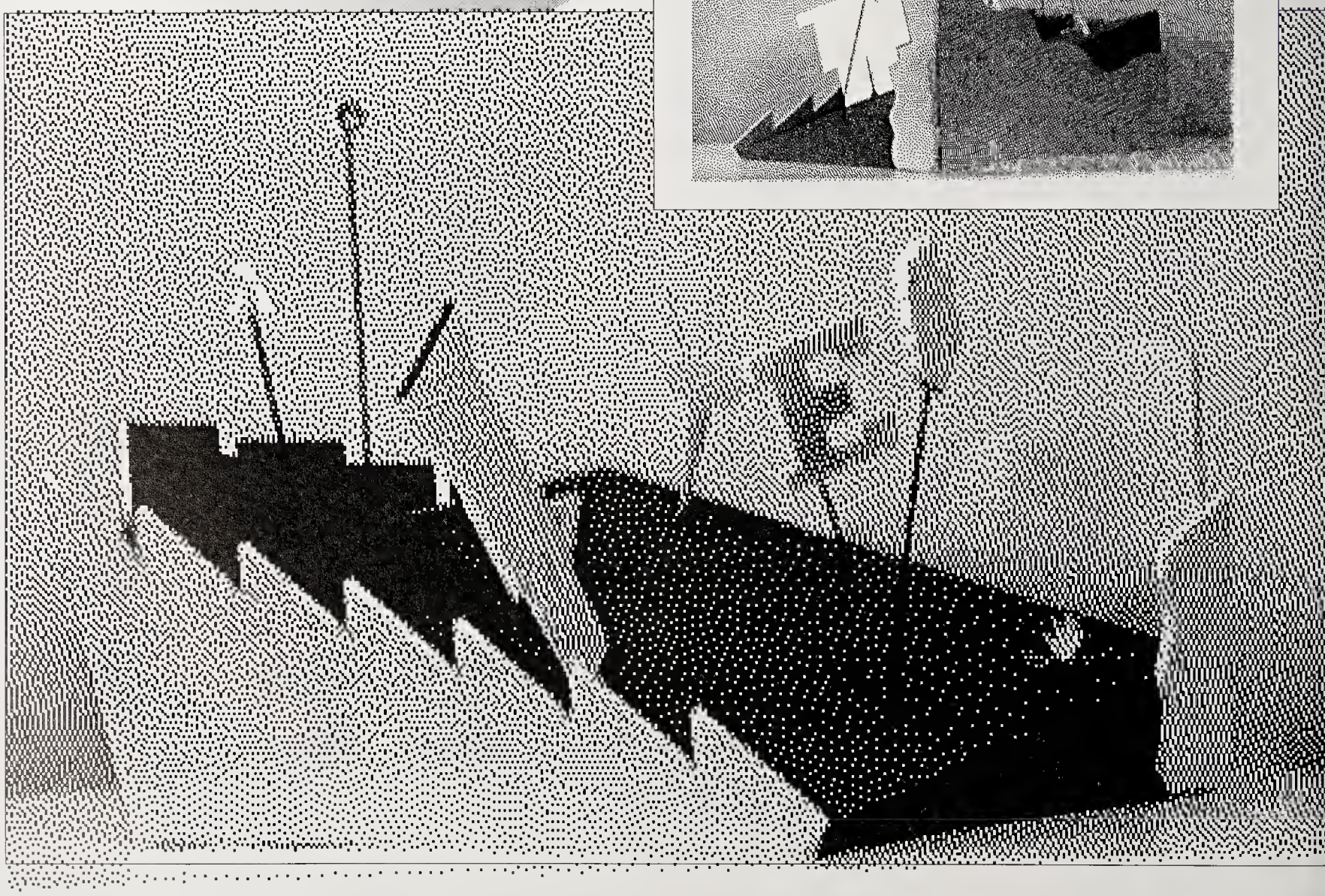
answering machines, junk mail, sex mail, mini-malls, sushi, bowling alleys, no pedestrians, no center, tan bums, tv news icons, sports graphics, giant l.e.d.s, bad air, Santa Anas, Palm Springs, white shoes, shorts, formal jogging clothes, formal casualness, yard sales, loud music, lack of reading materials, no good newspapers, electronic paintboxes, video crews,







Pacific Wave Model



movie locations, stretch-limos with jacuzzis, sequin dresses, cowboy boots, Frederick's of Hollywood, the lottery, the Bowl, the Valley,

The Getty, dunkin-donuts, microwave popcorn, automatic garage doors, remote controls, dimmer switches, coke wars, gas wars, 7-11, 3D t.v., margaritas, chips + guacamole, pita burgers, teriyaki dogs, fotomats, drive-ins, palm readers, baseball, football, basketball, cable t.v., music videos, mtv, lack of tradition, the speed, the drama of the nothingness, the weirdness, the conservatism, video arcades, mini-marts, the emptiness, the fullness, the stupidness, the stuff, ecstasy, the earthquake, plastic, the blondes

PAOLO UTIMERGHER

Pacific Wave sculpture in Venice

the blendo, pink + turquoise houses, lilies of the nile, palm trees, the light, ocean, desert, the Chinese, the Koreans, the Japanese, the Mexicans, the Thai, the movies, the IMAX, the dome, the water, the cars, the cypress, the deco, hi tech, entrepreneurs, the produce, the many lettuces, the piers, the designer jeans, racketball, soft-shell crabs, the menudo, tommy's burgers, domino's pizza, financial news network, the mac, the tax, the car alarms, car wash video arcades, ms. pacman, frogger, the diffuseness, the density, sex party lines, 800 numbers, the rad, the awesome

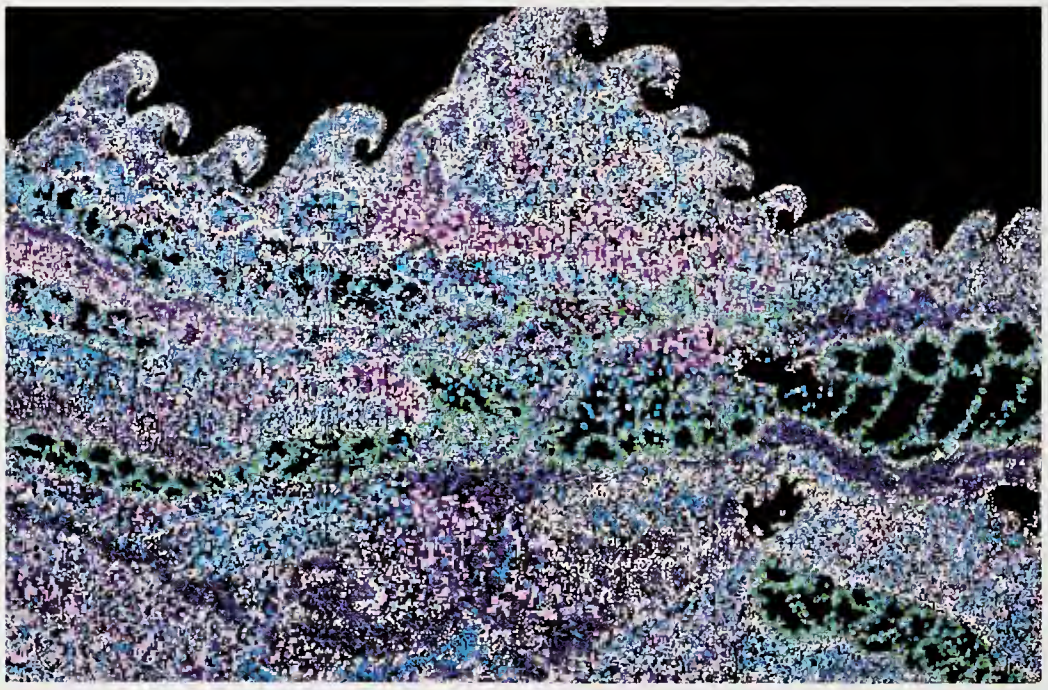
jaywalking tickets, vanity plates, plastic surgery, the diet salons, the hugeness, measuring distance by driving time, the Cadillacs, the wealth, the 4 wheel drives, the RV's, the diamond lanes, the headsets, the

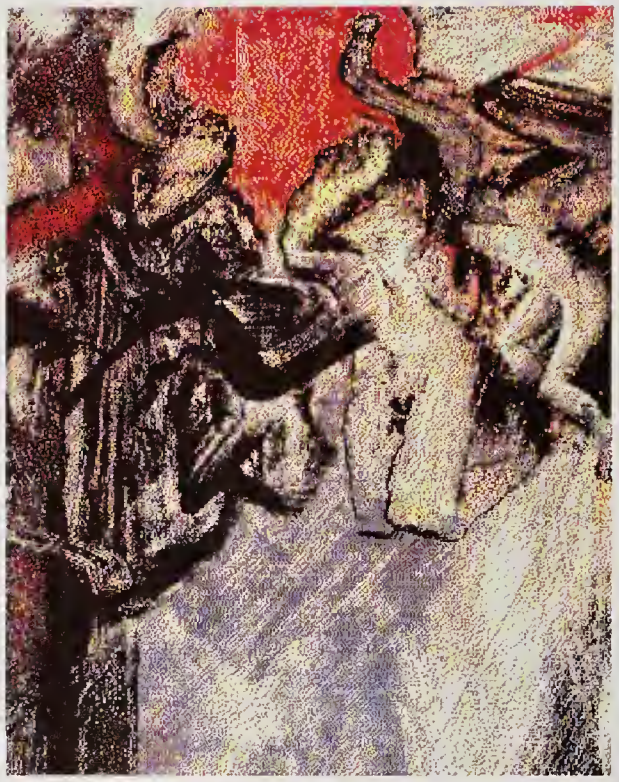
dishes on lawns, the cable t.v. box, the t.v. guide, the car show, t.v. shopping shows, The Source, Let's Chat . . ., MacDonaldland Monopoly, the theme parks, the salad bars, styrofoam cups, creamora, sweet'n'low and, nutrasweet wars, excedrin and tylenol scares, AIDS, AA . . . on board signs

Exhibition Poster (27" x 39")

MEREDYTHE DEE

"Waves" was produced by Meredythe Dee on an Amiga 1000 using Art World software developed by Howard Ganz. It was printed on a Diablo C-150 ink jet printer.





MARIUS JOHNSTON

"Apple of my Eye" by Marius Johnston. was created on a Mac Plus using FullPaint to combine ThunderScanned images and printed on an ImageWriter II using ColorPrint. Each piece is printed as a monoprint on cotton paper.

MICHAEL GOSNEY

"2" (left) and "Solar Zap" (right) were rendered on a Mac II with SuperMac Technology's new PixelPaint program.

JOSE A. CICCONE

"Eye" by Jose A. Ciccone was created with CricketDraw on a Mac Plus. This piece is part of Olduvai Software's Post-Art clip art package, which contains Ciccone's Adobe Illustrator, CricketDraw, and MacDraw art.

LASLO VESPREMI

"MacOffice" was created with Adobe Illustrator by *MacWeek* art director Laslo Vespremi.

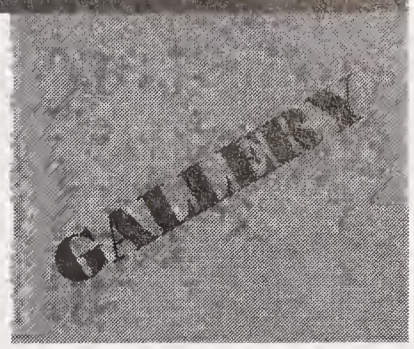
MIKE SWARTZBECK

1. "Escape 2" by *Verbum* regular Mike Swartzbeck was created with Macromind's GraphicWorks (distributed by Mindscape). Mike used the program's different ink modes (Xor, Matte, etc.) to layer several Thunder-Scanned bitmapped images in this intriguing composition.

1

2. "Siren" also by Swartzbeck, was produced with GraphicWorks by superimposing ThunderScanned paint images on top of each other. He used GraphicWorks' elegant airbrush to achieve the "nebular mist" effect.

2



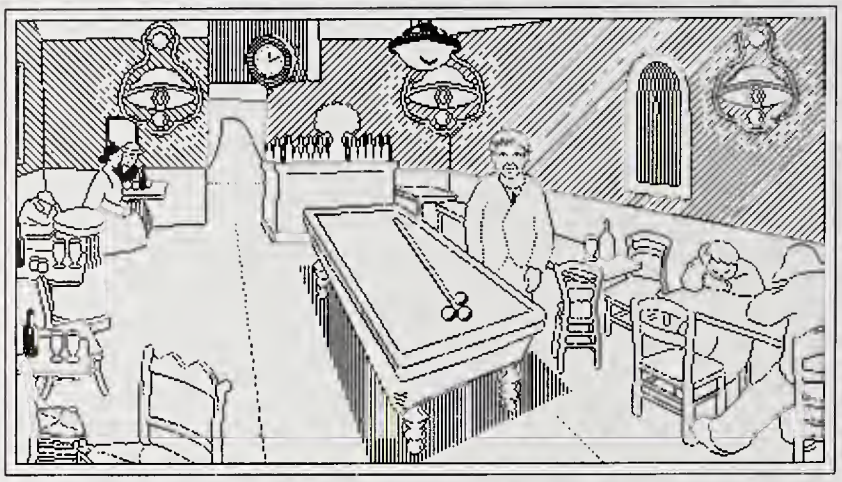
BERT MONROY

"Pearlcorder" was drawn in Adobe Illustrator by New York Macintosh artist Bert Monroy. The file is surprisingly small and prints very quickly.

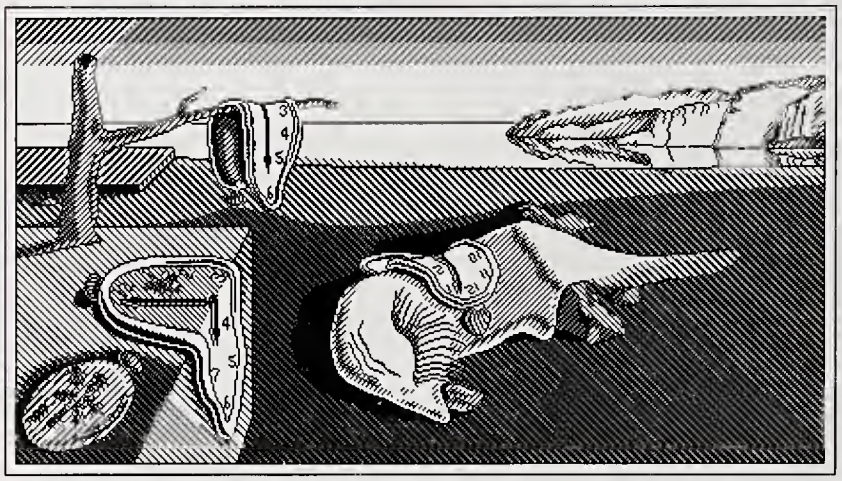
MARTIN SPEED

Martin Speed of Cincinnati, Ohio created a series of bit-mapped classics in homage to modern art masters, five of which are reproduced here. These pieces were drawn freehand in MacPaint on a Macintosh 512.

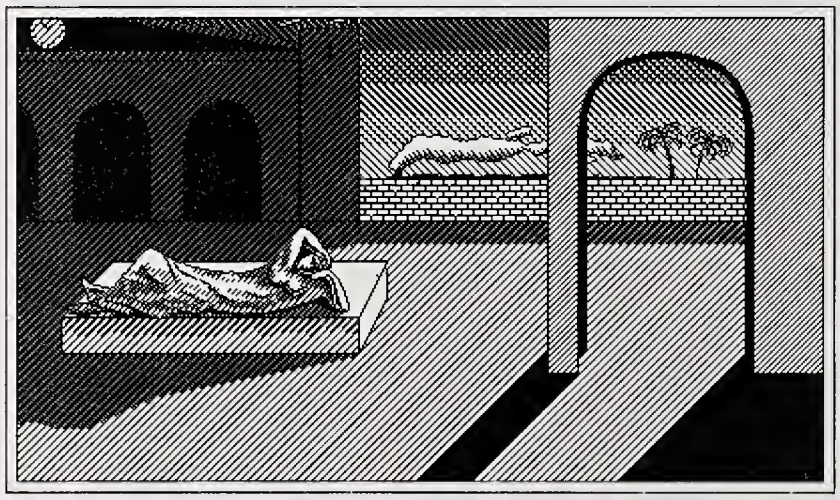
1



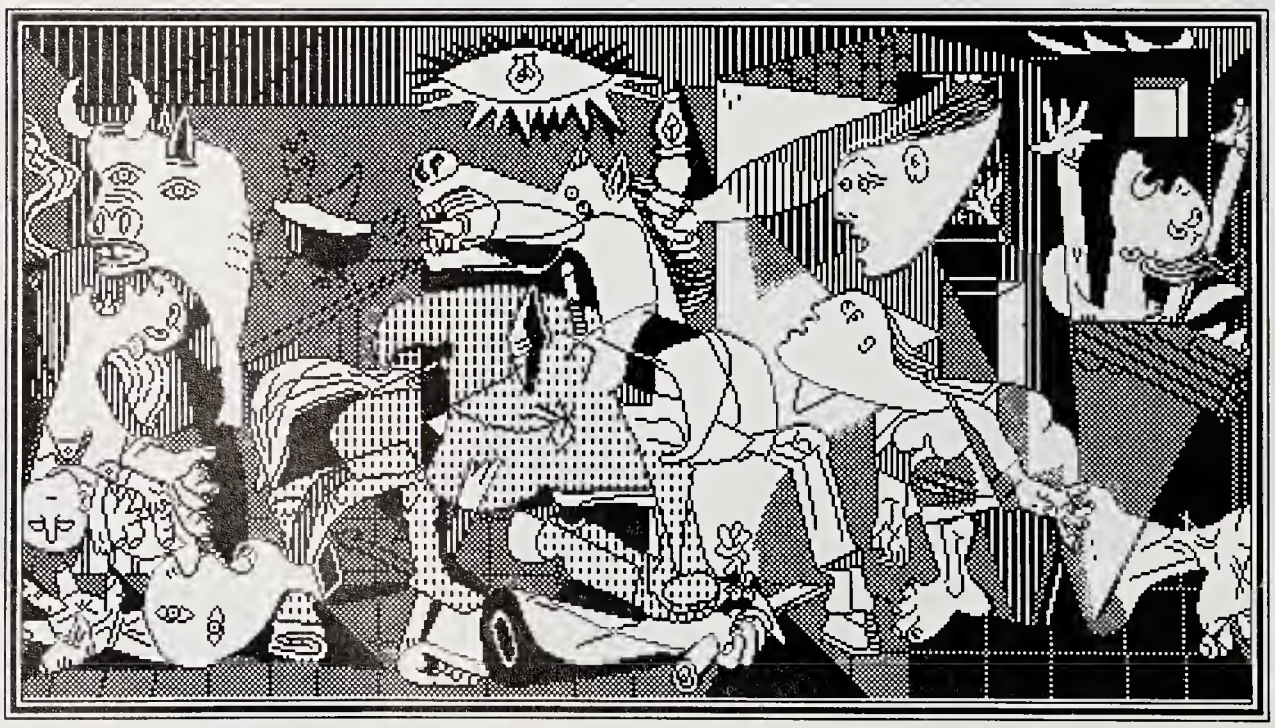
2



3



4



5

1. "Night Cafe" Vincent Van Gogh, 1898
2. "Persistance of Memory" Salvador Dali, 1931
3. "Soothsayer's Recompense" Giorgio Chirico, 1913
4. "Guernica" Pablo Picasso, 1937
5. "Vision After the Sermon" Paul Gauguin, 1888 (right)

NIRA

Los Angeles artist Nira used ImageStudio to modify a MacPaint file to produce "The Kiss."

CREATING 3-D ILLUSIONS ON A 2-D MEDIUM

Tony Smith

Today there are several application packages available for creating and manipulating geometric objects, including text characters, in three-dimensional space (see the box at the end of the article). Like the more familiar 2-D drawing (and painting and writing) tools, each of these packages offers quick, interactive, often WYSIWYG, ways of producing some specific subset of all possible 3-D illustrative effects. This month, "Painting by Numbers" looks not at these packaged solutions but instead at the kinds of experimental work that had to be done with much cruder tools to reveal potentially productive areas for later tool builders to follow through in their own time.

Historically, if two years can really be called "history," this story starts from some of the earliest experiments with the direct use of PostScript [1] and continues through to some quite recent discoveries. Most of those early effects have long since been incorporated as features of some 3-D or 2-D graphics tool, while the more recent may indicate some of what is to come in the next round of such packages. However, the very purpose of "Painting by Numbers" is to provide some awareness of the seemingly "non-art" processes through which new classes of electronic brushes can be conceived — in this issue the geometry and algebra and even calculus that are needed to work between 3-D and 2-D representations of objects. So I will try to strike a balance between the very real science and math that underlies your computer graphics tools and this opportunity to try to communicate a basic understanding that will be of use to some artists.

Visual perception of space is a complex process. Just like a camera, our eyes form a two-dimensional image of the scene in front of them. Mechanical clues to depth are provided by changes in lens focus required to produce a sharp image, by the differencing of the images produced by a pair of slightly separated eyes, and by objects obscuring one another as they move within the visual field. Beyond the capabilities of any mechanism yet developed, cognitive processes provide incredibly fast identification of familiar objects within the field of vision, and knowledge of their actual size greatly enhances depth perception.

```
{inHard Disk:Full Polys}
{ps}
/TurnXYZ
  { ax /mat1 mat0 store mat1 rotate transform 3
-1 roll
    ay /mat1 mat0 store mat1 rotate transform 3
-1 roll
    az /mat1 mat0 store mat1 rotate transform 3
-1 roll
  } def

/DrawFace
  { Vertex face 3 get get aload pop TurnXYZ pop
moveto
    4 1 face length 1 sub
      {Vertex face 3 -1 roll get get aload pop
TurnXYZ pop lineto}
    for
    closepath
    /angcos x px mul y py mul z pz mul add add
size psize mul sqrt div def
    angcos
    1 add 2 div
    dup 0 lt {pop 0} if
    dup gsave setgray fill grestore
    2 exp setgray stroke
    /n n 1 add def
  } def

/FindFace
  { /face exch def
    face 0 get face 1 get face 2 get TurnXYZ
    /z exch def /y exch def /x exch def
    z lim gt {DrawFace} if
  } def

/WhichFaces
  { /which exch def
    which sizes length lt {/size sizes which get def} if
    ranges which get 1 ranges which 1 add get 1 sub {solid exch get FindFace} for
  } def

/FaceNos
  { gsave
    /rad exch def
    translate
    rad rad scale
    0 setlinewidth
    /solid exch def
    /faces solid length 3 sub def
    /sets solid faces 1 add get def
    /ranges [0 sets {1 index add} forall] def
    /sizes solid faces 2 add get def
    /multi sets length sizes length gt def
    /n 0 def
    multi {WhichFaces} {0 1 sets length 1 sub {WhichFaces} for} ifelse
    grestore
  } def

/lim 0.000001 def
/mat0 matrix def /mat1 6 array def
/px -1 def /py 1 def /pz 1 def /psize 3 def
/ax 0 def /ay 0 def /az 0 def

297 423 translate 0.84 dup scale -306 -396 translate 75 2 -1 atan {pop} setscreen 0.8 setgray
%statusdict begin 11.5 72 mul 9 72 mul 9 0 setpageparams end 18 18 translate
-18 -18 moveto -18 810 lineto 630 810 lineto 630 -18 lineto closepath clip fill
QQ
{inHard Disk:Logos:Coarse}
{ps}
gsave
63 -63 translate
/ang -30 def
45
  { Icosahedron 72 ang cos mul 72 ang sin mul 24 FaceNos
    Dodecahedron -72 ang cos mul -72 ang sin mul 24 FaceNos
    6 12 translate 1.03 dup scale /ang ang 24 add store
    /ax ax 12 add store /ay ay 4 add store /az az 1 add store
  } repeat
grestore

0 -18 moveto 0 0 9 270 180 arcn -18 0 lineto
-18 792 moveto 0 792 9 180 90 arcn 0 810 lineto
612 810 moveto 612 792 9 90 0 arcn 630 792 lineto
630 0 moveto 612 0 9 360 270 arcn 612 -18 lineto
1 setgray stroke
QQ
```

Figure 1 — The view of the steps shown here and a complementary view were used in turn as a base for the tower in lead-up advertisements, then combined by superimposing their smallest levels for a final promotion carrying the caption "Whichever way you look at it . . . You certainly must be there."

Figure 2 — A perspective view of Sydney's Centrepoint tower. My PostScript for the tower relies on back-to-front sequence running from the tip of the mast to the underside of the upper decks, without provision for reversal. So any attempt to "view" the tower from any higher than the base of the observation levels would just produce a mess.

As an essential part of their never-ending quest for simplification and classification, our cognitive processes also quickly discard most of the richness of a three-dimensional world in favor of building up a mental library of 2-D images supplemented by minimal depth clues. Although our retinas (and our camera films) capture true perspective images whenever they are exposed, even the simple perspective drawing of a road disappearing into the distance is very much a learned skill. From cave painters through to untrained children of today, familiar objects are naturally drawn in two dimensions as viewed square on from their most characteristic angle — be it front, side, or top.

All this is hardly new information to an artist. The purpose of this column is to extend the realization that the graphics capabilities recently built into personal computers and their printers are also very much constrained to a 2-D emphasis imposed by the nature of computer screens and printer paper. Virtually all screens and graphics printers operate by a raster mechanism, which breaks down an image into a rectangular array of dots that are then stored as an effectively linear array of color values [2] in computer memory and transmitted to the screen or printer one "fast scan" (almost always horizontal) line at a time. Built-in software, such as Macintosh's QuickDraw and LaserWriter's PostScript, takes care of vertical coördination of image elements between adjacent scan lines, but leaves it entirely in the hands of application software to map a true perspective view of a 3-D scene into the computer's repertoire of 2-D drawing operations.

As mentioned earlier, this issue's column is primarily concerned with the phase of work that precedes the design of such applications, in this case the use of "hand-written" PostScript to produce a succession of 3-D illusions. The inverting steps (Figure 1) and the Centrepoint tower (Figure 2) date back to my earliest expo-

```
%!PS-Adobe-1.0
%%Title: Whichever
%%Creator: Tony Smith
%%BoundingBox: 0 0 612 792
%%EndComments
initgraphics
grestoreall
%%EndProlog

/DoFitting
  { /width exch def
    matrix currentmatrix
    [width thistext stringwidth pop div
    dup incline mul 0 fontsize 12 div 0 0]
concat
    thistext show
    setmatrix
  } def

/SpecialFit
  { /fontsize exch def
    /wordstack exch def
     4 sub /x1 exch def 4 add 4 incline mul
add /y0 exch def
    dup 4 add /x0 exch def
    wordstack
      { /thistext exch def
        x0 y0 moveto x1 x0 sub DoFitting
        /y0 y0 fontsize add def
      } forall
    /incline 0.5 incline sub def
  } def

/Invert
  { dup cvx exec aload length /numb exch def
    numb 2 idiv {320 exch sub numb 1 roll
448 exch sub numb 1 roll} repeat
    numb array astore def
    dup cvx exec aload  length /numb exch
def
    numb {neg numb 1 roll} repeat
    numb array astore def
  } def

/Steps
  { /inverted exch def
    /addsub inverted {/sub} {/add} ifelse
cvx def
    /flat [0 0 24 12 248 12 416 96 448 96
256 0] def
    /delf [24 44 24 44 -8 44 -32 32 -32 32 -
8 44] def
    /wall [24 44 0 32 0 0 24 12 248 12 416
96 448 96 448 128 416 128 248 44]
          def
    /delw [24 44 0 32 0 32 24 44 -8 44 -32
32 0 32 0 32 -32 32 -8 44] def
    inverted {/delf /flat Invert /delw /wall
Invert} if
    /text [( ) (AUDIO-VISUAL) (EXTRAVAGANZA)
( )
           (MAC) (COMMUNITY &) (LEISURETIME)
("4 U")
           (APPLE) (TALK OFFICE) (NETWORK-
ING) (5 MODELS)
           (MACINTOSH) (INTERNATIONAL) (CON-
FERENCE) (4 STREAMS)
           (MACWORLD EXPO) (HANDS-ON)
(WORKSHOPS) (THREE ROOMS)] def

    gsave
    1 setlinewidth 1.415 setmiterlimit
    6 { newpath flat aload pop moveto 5 {lineto}
repeat closepath
       stepcol setgray gsave fill grestore main-
col setgray stroke
       flat aload pop delf aload pop 12 {12
index add 24 1 roll} repeat
       12 {pop} repeat 12 array astore /flat
exch def
     } repeat
    flat aload pop 6 {32 addsub 12 2 roll} repeat
    12 6 roll exch 2 mul 7 index sub exch 2 mul 6
index sub 12 6 roll
    moveto 5 {lineto} repeat closepath
    stepcol setgray gsave fill grestore maincol
setgray stroke

    /Helvetica-Bold findfont 12 scalefont setfont
    /fontsize 32 def
    /incline inverted (0.5) (0) ifelse def
    5 { newpath
       wall aload pop moveto 9 {lineto} repeat
       closepath stroke
       mark
       wall aload pop 20 2 5 addsub roll 9 array
astore /textx exch def
       cleartomark
       text aload pop 20 -4 roll 4 array astore
/texta exch def
       texta aload pop 20 array astore /text
exch def
       textx aload pop texta aload pop 4 2 10 {-
1 roll 12 -2 roll} for
       4 { 4 sub /x1 exch def 4 add 4 incline
mul add /y0 exch def
           /thistext exch def dup 4 add /x0 exch
def
           thistext ( ) eq {/Symbol findfont 12
scalefont setfont} if
           x0 y0 moveto x1 x0 sub DoFitting
           /incline 0.5 incline sub def
           thistext ( ) eq {/Helvetica-Bold
findfont 12 scalefont setfont} if
         } repeat pop
       wall aload pop delw aload pop 20 {20
index add 40 1 roll} repeat
       20 {pop} repeat 20 array astore /wall
exch def
     } repeat
    wall aload pop 3 {32 addsub 20 2 roll} repeat
    20 10 roll 2 {32 addsub 20 2 roll} repeat
    20 array astore /wall exch def
    wall aload pop moveto 9 {lineto} repeat
    closepath stroke
    mark
    wall aload pop 20 2 5 addsub roll
    [(EXPOSITION)] 76 SpecialFit
    [(ACCESSORIES) (PERIPHERALS) (SOFTWARE)] 20
SpecialFit
    [(SERVICES) (PRODUCTS) (DEALERS)] 20
SpecialFit
    [(MACWORLD)] 76 SpecialFit
    cleartomark
    grestore
  } def
```

```
%!PS-Adobe-1.0
%%Title: Centrepoint
%%Creator: Tony Smith
%%BoundingBox: 0 0 612 792
%%EndComments
initgraphics
grestoreall
%%EndProlog

/PerspArc
  { /posneg exch def
    /to exch def
    /from exch def
    /rad exch def
    /y exch def
    /persp y y0 add viewht sub viewrad div def
    matrix currentmatrix
    0 y translate
    1 persp scale
    0 0 rad from to posneg {arc} {arcn} ifelse
    setmatrix
  } def

/StayOne
  { /hiang exch def
    /loang exch def
    loang sin lowid mul
    loang cos lodep mul moveto
    hiang sin hiwid mul
    hiang cos hidep mul height add lineto
    stroke
  } def

/StayLeft {dup turn sub StayOne} def
/StayRight {dup turn add StayOne} def

/BandCalc
  { /halfthick exch def
    /bandht exch def
    bandht viewht lt {/halfthick halfthick neg
def} if
    /ratio bandht height div def
    /x lowid 1 ratio sub mul hiwid turn cos mul
ratio mul add def
    /y hiwid turn sin mul ratio mul def
    /bandrad x 2 exp y 2 exp add sqrt 1.035 mul
def
  } def

/BandBack
  { BandCalc
    bandht halfthick sub bandrad 0 360 true
PerspArc
    fill
  } def

/BandFront
  { BandCalc
    bandrad neg bandht halfthick sub moveto
    bandht halfthick sub bandrad 180 0 false
PerspArc
    bandht halfthick add bandrad 0 180 true
PerspArc
    closepath
    fill
  } def

/ShaftEtc
  { /y0 0 def
    /height 7 inch def
    /rad 10 def
    /lowid 60 def
    /hiwid 20 def
    /turn 135 def
    /lodep viewht neg viewrad div lowid mul def
    /hidep height viewht sub viewrad div hiwid mul
def
    gsave

    black setgray
    3.5 inch 3 BandBack
    5.5 inch 3 BandBack

    0.25 setlinewidth
    gold setgray
    170 24 361 {StayLeft} for
    22 24 213 {StayRight} for

    black setgray
    rad neg 0 moveto
    0 rad 180 0 false PerspArc
    height rad 0 180 true PerspArc
    closepath
    fill

    gold setgray
    2 24 169 {StayLeft} for
    -146 24 21 {StayRight} for

    black setgray
    3.5 inch 3 BandFront
    5.5 inch 3 BandFront

    grestore
  } def

/Window
  { dup /lowx exch 2 mul 41 add def
    /hix lowx 1 add def
    /lowy exch 15 mul 6 add def
    /hiy lowy 9 add def
    lowx neg lowy moveto
    lowy lowx 180 90 false PerspArc
    hiy hix 90 180 true PerspArc
    closepath
    fill
  } def

/ObsLevels
  { /y0 7 inch def
    gsave
    0 y0 translate

    white setgray
    3 41 0 360 true PerspArc
    fill
    black setgray
    2 40 0 360 true PerspArc
    fill
    white setgray
    0.5 25 0 360 true PerspArc
    fill

    black setgray
    -41 3 moveto
    3 41 180 0 false PerspArc
    63 49 0 180 true PerspArc
    closepath
    fill
    white setgray
    0 1 3 {Window} for

    grestore
  } def

/UpperTower
  { /y0 8 inch def
    gsave
    0 y0 translate

    gold setgray
    1 setlinecap
    0 54 moveto
    0 30 rlineto
    8 setlinewidth
    stroke
    0 84 moveto
    0 60 rlineto
    4 setlinewidth
    stroke

    white setgray
    44 28 0 360 true PerspArc
    fill
    black setgray
    44 28 0 360 true PerspArc
    0.5 setlinewidth
    stroke
    -28 45 moveto
    44 28 180 0 false PerspArc
    54 28 0 180 true PerspArc
    closepath
    fill

    -22 30 moveto
    22 30 lineto
    43 22 0 180 true PerspArc
    closepath
    fill

    gold setgray
    -30 -9 moveto
    30 -9 lineto
    30 28 0 180 true PerspArc
    closepath
    fill

    grestore
  } def

/CentrePt
  { /viewht exch 10 inch mul def
    /viewrad exch 10 inch mul def
    10 div dup scale
    UpperTower
    ObsLevels
    ShaftEtc
  } def
```

sure to PostScript. I used it to prepare some promotional materials for the Sydney Macworld Expo of November 1985. The tower was first drawn from a specific viewing position and later generalized into variable height and distance viewing. My PostScript code to generate the tower was rather specific, using a minimum of simple procedures to provide correct aspect ovals representing circular boundaries. By contrast, the inverting steps are produced by a rather convoluted PostScript program that goes through a repeated series of operations to fit the words uniformly within the rectangles and oblique parallelograms that represent the steps.

Most of my subsequent effort on the 3-D front has concentrated on my company's picahedron logo (Figure 3) and its derivative solids, for which illumination angles have been a vital consideration. As well as being instructive in the essential mathematics for such an exercise, the story of the development cycles of the logo elucidates some of the practical issues involved in making our use of PostScript more efficient.

The approach I took to describing the picahedron image was first to build up a table of all its vertices, relying on its strong symmetry to greatly simplify the process of identifying each and every one. In fact, it turns out that these coördinates (based on unit radius) are generally zero, one, the square root of one-third, or one of several trigonometric functions of the golden ratio [3].

As the picahedron's faces are all congruent triangles, the next step was to look for all pairs of vertices separated by exactly the length of an edge of such a triangle and from those edges to determine which groups of three actually bounded triangular faces. The reality of the three edges having different lengths actually made this a bit simpler to implement. Of the 62 vertices, 30 are at the junction of four edges, 20 at the junction of six edges, and 12 at the junction of ten edges. The shortest edges always join a "four" point with a six, and the intermediate-sized edges join a four with a ten. Therefore, for each four point, it was only necessary to find the two "connected" sixes and the two connected tens to be able to fully identify the four triangles that surround that point.

Correct rendition called for the elimination of all backward-facing faces. Working with three-dimensional coördinate axes, backward-facing faces are those having the z-axis toward the viewer, for which the (total) z value is negative. To get the lighting effects correct then required some half-forgotten vector algebra. To this end the PostScript program was able to

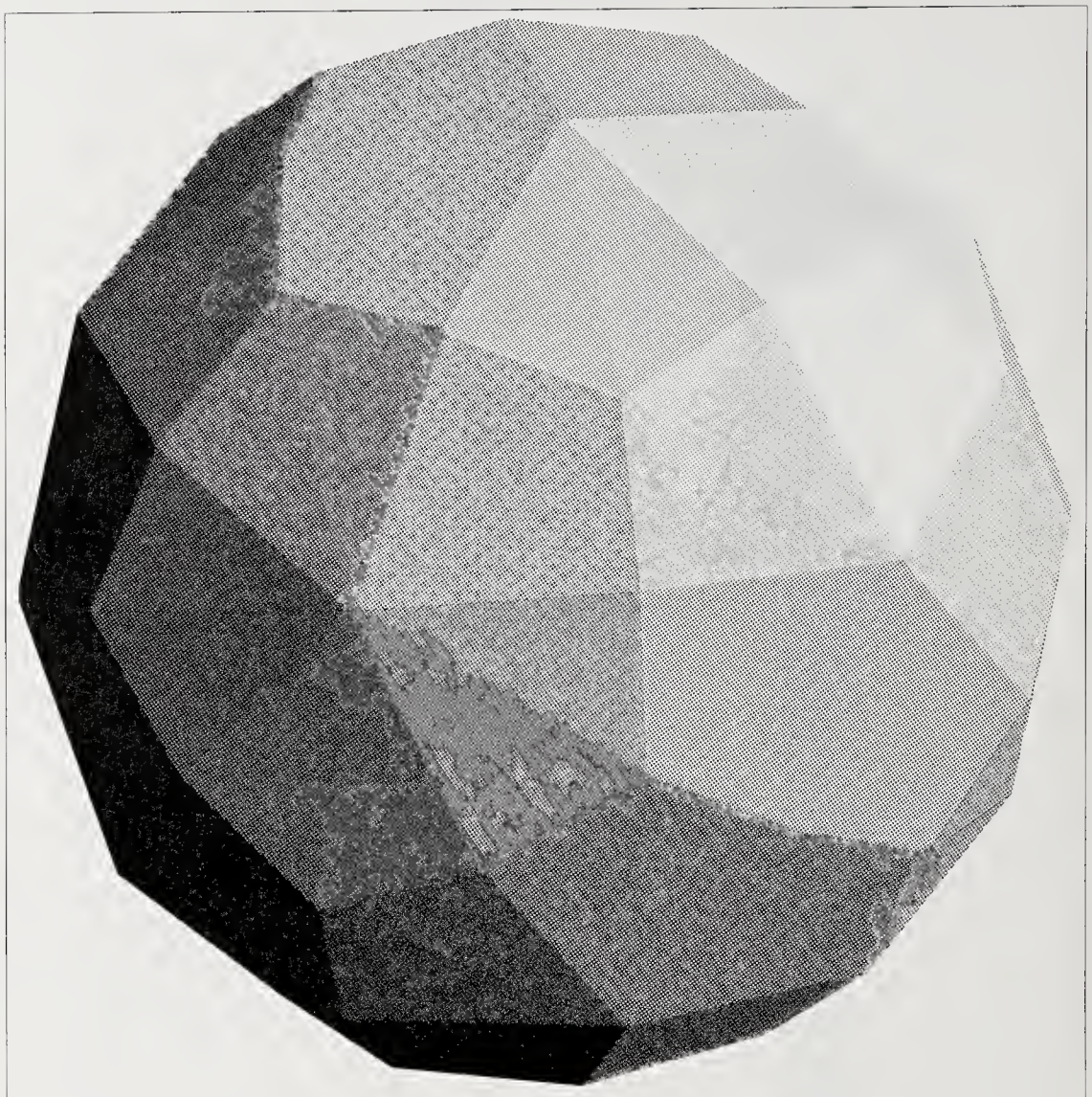


Figure 3 -- A slightly rotated view of the 120-sided picahedron solid which, when it is squared up, is used as the logo of my company, PICA Pty Ltd. My first attempt at writing the PostScript to generate the logo took a three-day weekend and help from a couple of my colleagues with some of the tricky mathematics involved.

```
{inA:Tony Smith 3-D:Full Polys}
{ps}
/TurnXYZ
  { ax matrix rotate transform 3 -1 roll
    ay matrix rotate transform 3 -1 roll
    az matrix rotate transform 3 -1 roll
  } def

/DrawFace
  { Vertex face 3 get get aload pop TurnXYZ
pop moveto
    4 1 face length 1 sub
      {Vertex face 3 -1 roll get get aload
pop TurnXYZ pop lineto}
    for
    closepath
    /angcos x px mul y py mul z pz mul add
add size psize mul sqrt div def
    angcos
%    dup 0 lt {pop 0} if
    1 add 2 div
    dup gsave setgray fill grestore
    2 exp setgray stroke
    /n n 1 add def
  } def

/FindFace
  { /face exch def
    face 0 get face 1 get face 2 get TurnXYZ
    /z exch def /y exch def /x exch def
    z lim gt {DrawFace} if
  } def

/WhichFaces
  { /which exch def
    which sizes length lt {/size sizes which
get def} if
    ranges which get 1 ranges which 1 add
get 1 sub {solid exch get FindFace} for
  } def

/FaceNos
  { gsave
    /rad exch def
    translate
    rad rad scale
    0 setlinewidth
    /solid exch def
    /faces solid length 3 sub def
    /sets solid faces 1 add get def
    /ranges [0 sets {1 index add} forall]
def
    /sizes solid faces 2 add get def
    /multi sets length sizes length gt def
    /n 0 def
    multi {WhichFaces} {0 1 sets length 1
sub {WhichFaces} for} ifelse
    grestore
  } def

/lim 0.000001 def
%clippath fill
%Picahedron 37 get dup dup 0 get /px exch
def 1 get /py exch def 2 get /pz exch def
%Picahedron dup length 1 sub get 0 get /
psize exch def
/px 1 def /py 1 def /pz 1 def /psize 3 def
/ax 5 def /ay 10 def /az 15 def
Picahedron 297 423 171 FaceNos
%Truncated 117 153 81 FaceNos
%Icosahedron 297 153 81 FaceNos
%Dodecahedron 477 153 81 FaceNos
%/u 72 def 0 1 4 {Octahedra u 738 36 FaceNos
/u u 90 add def} for
%/u 72 def 0 1 4 {Cubes u 648 36 FaceNos /u
u 90 add def} for
%/v 738 def 0 1 5 {Tetrahedra 522 v 36
FaceNos /v v 90 sub def} for
%/v 558 def 6 1 9 {Tetrahedra 432 v 36
FaceNos /v v 90 sub def} for
QQ
```

calculate the direction of a line perpendicular to a 3-D face as the cross product of the vectors for any pair of edges. The light level of a face was accurately given by another basic mathematical function — the cosine of the angle between that perpendicular and the arbitrarily oriented light source — a value given simply by the dot product of those two vectors.

For our logo the light source angle was chosen to be exactly perpendicular to a selected face within the upper right quadrant, guaranteeing one exactly "white" face. Because of the limits of resolution of all existing PostScript printers, the small angle between pairs of faces sharing the same long side ensured that there are actually two white faces.

Fortuitously, the measure of illumination given by this dot product and cosine calculation ranged from one for maximum light to negative values on unlit faces, and that corresponded almost perfectly with PostScript's use of gray levels from one for white to zero for black. All the picahedron gray-level calculation needed was to turn the various negative lighting values for unlit faces to exactly zero. To give a more uniform appearance, the faces were sorted into a sequence from lightest to darkest for display and a thin line that was arbitrarily darker than the darker of each pair of faces was added to better define their boundaries.

One major problem with that approach was that all those calculations had to be repeated every time we wanted to print the logo on any letterhead, business card, reply envelope, promotional literature, or advertisement. So after a few months of annoyingly slow printing of such documents, my increasing appreciation of the fundamental design considerations underlying PostScript was brought into play, and I redeveloped the logo PostScript through use of a Microsoft Basic program that did almost all those calculations once and for all and simply generated a list of all 60 forward-facing faces together with an index in light-to-dark order of their gray levels. The remaining PostScript required to generate the logo only needed to take into account the position of the logo's center on the page and its radius. The time taken to develop and run that Basic program was insignificant when compared to the significant speed-up of printing every time that logo is used.

The logo's Basic code has been extended twice since. The first time, I extracted the truncated dodecahedron and the five Platonic solids whose vertices can also be found amongst those of the picahedron, just by using different edge lengths. For those interested in the recently publicized hypothesis of quasicrystals displaying

Figure 4 — Toby Thain, son of Australia's leading Mac artist Malcolm, invented the twisted ribbon special effect that encircles the picahedron — one of an increasing number of quite convincing 3-D illusions for which, unlike the picahedron, the PostScript itself appears to be totally devoid of explicit computations relating to the third dimension.

five-fold spatial symmetry [4], it is interesting to note that this procedure generates five octahedra, five cubes, and ten tetrathedra, each group with apparently equal angular separation. Isolation of the individual solids within those multiple sets required some additional programming, as did the establishment of coplanarity for the square and pentagonal faces compared to the much simpler process of finding triangles.

The most recent addition to the picahedron code was to complete the identification of all faces, not just the forward-facing ones — an obvious precondition to free rotation. The main extra complexity was ensuring that the orthogonal vectors required for illumination calculations were always oriented outward from the center of the solid, something that is almost trivial while negative and zero z can be ignored, but not quite so simple in the general case. The actual free rotation is now done in PostScript, as shown more generally in the helix on page 17.

Like the inverting steps, many simple 3-D illusions can now be produced with such second generation drawing tools as Adobe Illustrator and CricketDraw. However, manipulation of raw PostScript code remains a very efficient method of tackling some of the very special effects that find their way into the works of a few pioneering graphics production houses. For example, Malcolm and Toby Thain of Telegraphics in Australia have been working with path-tracking routines to produce such 3-D illusions as the satin ribbon that I have wrapped around a slightly off-square picahedron (Figure 4).

These five programs let you create the 3D effects for which early PostScript users had to generate code:

Dimensions
Visual Information, Inc.
16309 Doublegrove
La Puente, CA 91744
(818) 918-8834
Suggested retail prices:
$750 for Design Dimensions Black & White
$1395 for Design Dimensions Color
$395 for Solid Dimensions Black & White
$1295 for Solid Dimensions Color

Mac3D Version 2.0
Challenger Software
18350 Kedzie Avenue
Homewood, IL 60430
(312) 957-3475
Suggested retail price: $249

Minicad 3.0
Diehl Graphsoft, inc.
3246-K Normandy Woods Drive
Ellicott City, MD 21043
(301) 461-6488
Suggested retail price $495

Pro3D
Enabling Technologies, Inc.
600 S. Dearborn Street, Ste. 1304
Chicago, IL 60605
(312) 427-0386
Suggested retail price: $349

Super 3D and **Super 3D Enhanced** (for the Mac II)
Silicon Beach Software
P.O. Box 261430
San Diego, CA 92126
(619) 695-6956
Suggested retail prices:
$295 for Super 3D
$495 for Super 3D Enhanced

Footnotes

[1] Adobe's page-description language built into every Apple LaserWriter and an increasing range of compatible laser printers and laser image setters.

2] For many systems, "color" is confined to being either black or white as indicated by a single bit setting for each pixel. Some others use multiple "bit planes" to indicate shades of gray, combinations of primary colors, or coded mappings into a larger color palette.

[3] The golden ratio is the supposedly ideal ratio of rectangular long side to short side that remains constant if a square the width of the short side is cut from one end of the rectangle, leaving a much smaller one still of the same aspect ratio. For the numerate, this ratio is exactly $(\sqrt{5}+1)/2$ to 1, or very nearly 1.618034:1.

[4] "Quasicrystals," *Scientific American*, August 1986.

Michael Singleton

THE ARTIST'S TOOLBOX

QUICK ON THE DRAW

In *Verbum 1.1* and *1.2* we reviewed pixel-based paint programs and PostScript-driven graphics packages, respectively. Painting programs represent the first and simplest of the graphics packages, while PostScript-driven graphics software represents the cutting edge. Most of the graphics work done on the Mac, however, can be carried out with a third type of software, object-oriented programs controlled by Apple's QuickDraw. This article reviews currently released object-oriented programs. The newest and most comprehensive are covered first, those with intermediate capabilities second, and the original object-oriented packages last.

IT'S ALL IN THE ROM CHIPS

Most of the operating system functions and screen drawing routines of the Macintosh are directly related to code contained within the read-only memory chips (ROMs). One of the most significant of these routines is QuickDraw, a set of commands that control how items are displayed on the Mac screen and written to disk. The name QuickDraw is very appropriate as a description for this page- and screen-description language, developed by Apple to be very graphic in its interface and quick in its screen drawing.

QuickDraw is a graphics generator that uses geometric primitives (points, lines, arcs, circles, squares, polygons) to create images both on screen and on the Imagewriter printer. The tools available in a program such as MacDraw are representations of the geometric primitives available in QuickDraw. Since all of the programs reviewed in this article rely on QuickDraw routines, there are marked similarities in their tools and user interfaces.

THE UPS AND DOWNS OF QUICKDRAW

Built into the firmware of the Mac as it is, QuickDraw allows very fast redrawing of the screen, and it has become a *de facto* standard for Macintosh programs. But QuickDraw has some very serious limitations when it comes to getting the most out of a PostScript printer. A PostScript printer's driver must translate QuickDraw into PostScript. The printer's language has a "word" for every QuickDraw word, but it also has many more PostScript words that have no QuickDraw equivalents. This means that a user will not be able to take full advantage of a PostScript printer while using a QuickDraw program. Specifically, QuickDraw can't call upon the PostScript routines used for the following:

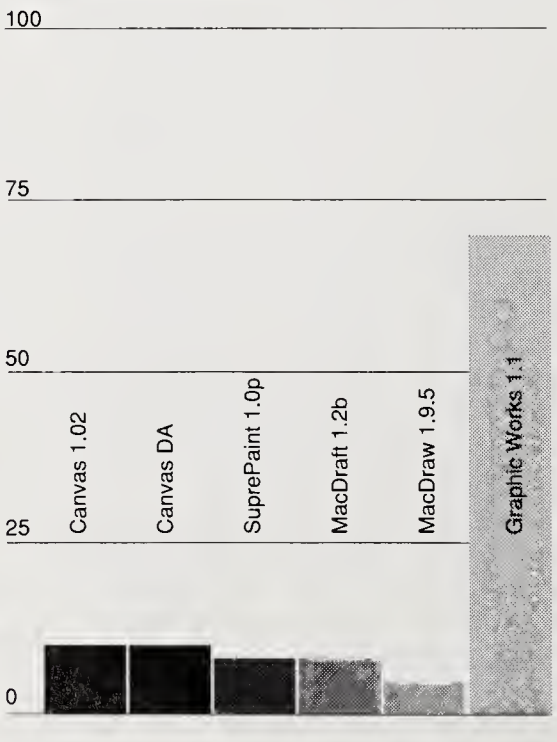
- Printing or displaying rotated fonts
- Specifying line weights of less than 1 point
- Maintaining consistent line weight through curves
- Controlling many special effects, including shadowing and font pattern specifications
- Editing the code of routines in the PostScript language line by line
- Compound line paths (straight line, arc, and Bezier curves joined into one path)

Program developers have found ways around these problems. Apple has published new specifications on how to add PictComments to code produced by QuickDraw-based programs, allowing more direct control of the translation of QuickDraw to PostScript. Apple has also released specifications for a new PICT 2 format that will extend the functions and compatibility of PICT files.

Adobe has clearly demonstrated the capabilities of PostScript by developing a program that takes full advantage of the language. Adobe Illustrator has been able to accomplish tasks that no other Mac graphics program to date can. It's clear that PostScript has dominated the laser printer page description market. Now developing "Display PostScript," Adobe could also corner a large part of the screen-draw description market. Apple must now either adopt the Display PostScript standard or extend the capabilities of its own QuickDraw routines to overcome some of its serious limitations. Third-party software developers are caught in the middle. Should they develop programs that display and write in PostScript? Or should they find other ways around the QuickDraw problems?

The programs reviewed here are good indicators of probable trends. Of the six programs tested, only Canvas has the ability to write PictComments that overcome many of QuickDraw's limitations. New versions of the other programs will undoubtedly also rely on PictComments to get around these problems. Apple is rumored to be working on a new version of QuickDraw that extends its capabilities. But if this new version doesn't appear soon, third-party developers will need to find their own work-arounds or switch to Display PostScript languages.

Number of Line Weights

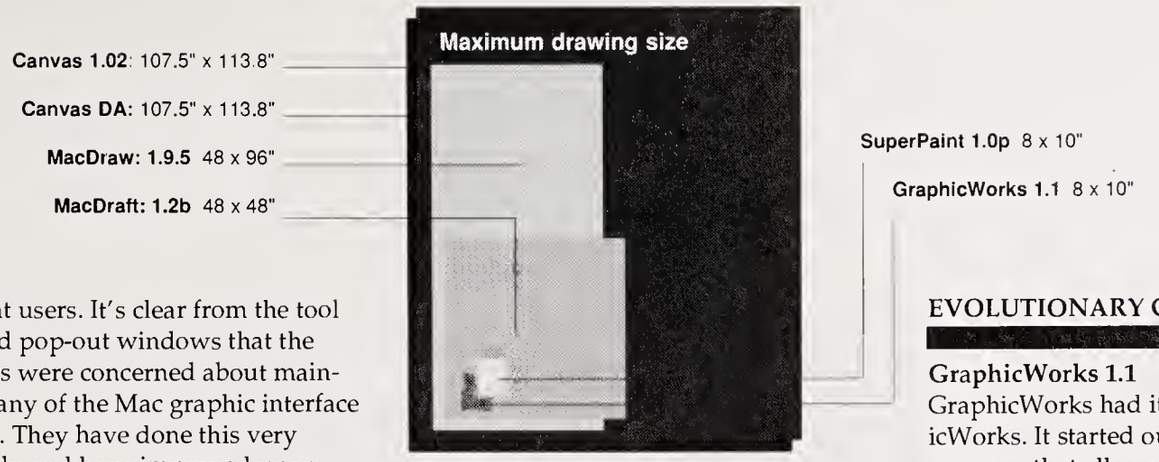


THE NEW KID ON THE BLOCK

Deneba Sytems has been paying attention to the frustratling limitations of existing object-oriented software packages such as MacDraw and MacDraft and has developed a program that resolves them. Overall, the Canvas program is very powerful and easy to use. What's more impressive, however, is that Deneba has been able to get most of the best features of the program into a desk accessory.

Canvas, the Program

The tool palette of Canvas will be very familiar to MacDraw, MacDraft, and


Maximum drawing size
Canvas 1.02: 107.5" x 113.8"
Canvas DA: 107.5" x 113.8"
MacDraw: 1.9.5 48 x 96"
MacDraft: 1.2b 48 x 48"
SuperPaint 1.0p 8 x 10"
GraphicWorks 1.1 8 x 10"

SuperPaint users. It's clear from the tool palette and pop-out windows that the developers were concerned about maintaining many of the Mac graphic interface standards. They have done this very successfully and have improved upon existing standards.

Integrating painting and drawing functions seamlessly was also a priority. MacDraw and MacDraft never attempted to integrate painting and drawing. GraphicWorks managed to get around some of the early limitations of painting by providing separate easels for separate paint objects. SuperPaint took a slightly different approach by creating two distinctive layers, a drawing layer and a painting layer. Objects from either layer could be transferred to the other and worked on with its tools. Canvas combines the best of these two approaches. It follows the easy interface of SuperPaint but without the separation of tool palettes and functions, and it uses a modified system of easels. This mixture of approaches makes it very easy to use and understand.

Another concern of graphics program users in these days of high-resolution printing devices is the ability to manipulate and place objects that have been created by high-res scanners. Canvas can import Tagged Image File Formats (TIFF) directly into the program. Once in the program, the TIFF object can be moved, resized, rotated, distorted, and otherwise edited. The object maintains its original scan resolution both on file and in the PostScript printer. The user should be aware, however, that high-res bit-mapped objects require a great deal of RAM and disk space, take substantially longer to print than lower-res objects, and are tedious to edit. But if you need to integrate standard QuickDraw objects with text, painting, and high-res bit maps, Canvas is the easiest and best program for accomplishing this.

Many more features in Canvas deserve to be acknowledged. Most of them are listed in the comparison chart at the end of this article. The features of this program that I feel set it apart from all the others are these:

- Large drawing size that breaks out from the 8-inch-by-10-inch limitations of previous paint programs
- The ability to zoom as many as 32 times both in and out
- The ability to rotate fonts, objects, and bit maps
- The ability to use multiple font styles and sizes in the same text block
- Several special-effect functions such as one- and two-point perspective distortions
- The ability to Import TIFF, PICT, and paint files
- The potential for including PostScript code commands within the program
- Duplication options that can control rotations and fill patterns
- The ability to make duplicates by holding down the Option key and dragging

Although it seems every new program has its problems, I could only identify a few in Canvas. First, the process of copying and pasting is slow. The program appears to go through a long screen redraw process each time you paste an item. Although you can have multiple fonts and styles in the same text block, you cannot change the justification of individual lines. This is not a critical limitation for graphics production, but it limits the program' s suitability for text-intensive page layouts. Overall, though, the program is an excellent buy.

Canvas, the DA

The Mac's integration capabilities allow the user to transfer a project from program to program to get just the right combination of tools needed to produce the final product. MultiFinder will make this transferring easier. For now, however, the Canvas desk accessory provides the best method of integrating graphics tools. When your word processor or page layout program lacks certain drawing capabilities, it is now possible to call up the Canvas DA to add them without quitting from the program.

The Canvas DA is perhaps the single most powerful DA available for the Mac today. Some of the features of the Canvas program had to be dropped to make the DA function with limited available memory. But a quick look at the comparison chart indicates that most of the important functions have been left intact.

EVOLUTIONARY CHANGES

GraphicWorks 1.1

GraphicWorks had its origins in ComicWorks. It started out as a painting program that allowed both the flexibility of painting and the ability to move bit maps as objects. Separate easels hold separate bit maps, and an easel and its contents can be shifted around independently of other easels. Recognizing the direction of the graphics software market, Mindscape added higher-resolution objects to the program's capabilities.

This article is concerned with the object-oriented graphics tools of GraphicWorks, though we recognize the advantages of integrating both painting and drawing functions and we acknowledge that the program has progressed substantially from its origins and should be given credit for these improvements. The object-oriented functions of the program, however, are minimal. The program lacks a freehand drawing tool and a useful polygon tool (you can use a balloon polygon and reshape it, but this is tedious). The drawing tools of the program seem to be there only to complement the painting functions and are not as strong as those of the other programs reviewed.

SuperPaint 1.01

SuperPaint was the first Mac program to integrate drawing and painting functions within the same program. The program provided strong painting capabilities and added PostScript fonts and object-oriented graphics. As with GraphicWorks, the drawing functions are only a back-up to the primary painting functions, and so the variety of features found within the draw layer of the program is not particularly rich. But the developers of the package have never marketed the product as a replacement for MacDraw or MacDraft, only as an improvement on MacPaint.

The best feature of the program is its very simple and straightforward approach to layers. The tool palette changes based on the mode you select. Because the tool palette lets you know right away which mode you are in, SuperPaint is easier to use than Canvas. It allows you to transfer bit maps from the paint layer to the draw layer so you can manipulate them, as though they were objects. The program also redraws moved objects faster than

most other software packages.

The most frustratling feature of SuperPaint is its size limitation. The drawing size is limited to 8 inches by 10 inches. This is true for most paint programs but is not acceptable for drawing packages. There is also limited use of multiple styles within the same text block. And the program can become very slow in its deleting and pasting functions.

THE OLD STANDARDS

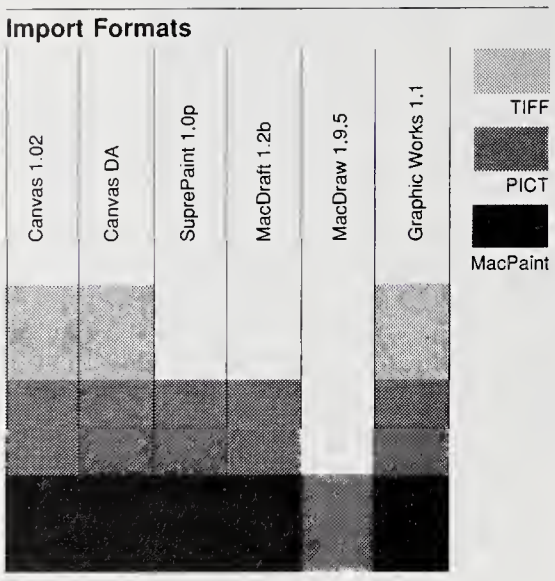
MacDraw and MacDraft can be considered to be the old standards for object-oriented Macintosh graphics. A lot of people have them and rely on them heavily. But the key word here is " old." These two programs have been around for a while. MacDraw, for example, is several years old and showing only a few changes since its introduction.

MacDraw 1.9.5

MacDraw was a very advanced program when it was first released. It encouraged many noncomputer graphic artists to draw on the Macintosh. It introduced most of us to Mac graphics. It was first to give us new tools like polygons, to show us how objects could be moved, overlapped, and resized, and we appreciated it. But Apple dropped the ball. Serious limitations and incompatibilities went unresolved. However, now that Apple has turned over the product to its subsidiary, Claris, we can expect further development of Mac Draw' s great potential. Claris has already released version 1.9.5, which has overcome some of the more serious incompatibilities. But 1.9.5 did not add any of these desperately needed features:

- Auto-scrolling of tools
- Additional line weights
- User-definable fill patterns
- Integration of bit maps
- Improved dimensioning specifications
- Increased font capabilities
- Variable zooms
- Rotation by degrees

Nevertheless, for many people MacDraw is still the appropriate tool to use. If you have very simple drawing requirements and you want the highest level of compatibility with other programs for transferring your files, then MacDraw could be for you. The rest of us, however, should either wait and see what comes from Claris or opt for another program.



MacDraft 1.2b

IDD introduced MacDraft, an extension of MacDraw in look, feel, and capabilities. It included many new and important features: auto-scrolling tools, rotations, various line weights, and so on. More important, MacDraft acknowledged the drafting requirements of many Mac owners, for example, the ability to scale drawings and to see dimensions of these drawings at their scaled size. This approach has put MacDraft half way between a general purpose graphics package and a computer-aided design (CAD) package, providing some of the best features of both. If you are a graphic artist, the CAD-like features won' t get in your way, and if you are an illustrator or draftsperson, the simple interface won' t limit you.

Some of MacDraft's users have pushed the product's definition and capabilities beyond what the developers originally intended. IDD has been rather sluggish in responding with new versions of the product that add new capabilities or fix existing problems (the earlier version of the product was plagued with bugs that were difficult to recreate but could always be counted on when you had just finished a long drawing session and hadn't saved yet).

MacDraft has very many users. Because of frustrations and limitations of the program, we may see MacDraft users switching to other software. General users of MacDraft will find Canvas appealing, and designers may switch to the newer full-featured CAD packages now available. But in my opinion, MacDraft is the best general purpose drafting package available for the Mac. The latest release, 1.2b, runs on all Macintosh machines, including the Mac II. For many design or drafting functions, a full-fledged CAD package is overkill. IDD has been dedicated to simplicity and providing a clear interface. Most CAD packages have given up the Mac interface to add features. MacDraft is very good at scaling drawings, showing dimensions of objects, labeling dimensions, rotating objects, defining fill patterns, customizing grid controls, and drawing arcs and tangents.

The tasks MacDraft still has problems with are selecting objects (sometimes you have to try several times), moving grouped objects that become mysteriously out of registration with each other, and accurately displaying items on screen, especially when zoomed in. MacDraft' s other serious limitations are linked to the limitations of QuickDraw, including restricted line weight capability; poor joins between lines, arcs, and tangents; limitations on font rotations; and irregular line weights for curves and polygons. IDD will probably address these limitations in the future by using PictComments, looking at other PostScript capabilities, or possibly developing new ways around the limitations of QuickDraw.

OTHERS ON THE HORIZON

Several new products have been rumored to be in development and close to release. MacDraw Plus from Claris is one of them. Press leaks have indicated that this new release will be able to specify color and display it on screen, be able to rotate fonts, include hairlines, provide better control of layering of objects, show dimensions better, have user-definable fill patterns, have improved zoom functions, provide auto-scrolling, and the list goes on. The product will have to be full featured to compete with Canvas and to help establish the newly founded Claris subsidiary.

Products that will be using Display PostScript, PICT 2 formats, and possibly new releases from Apple on QuickDraw ROMS will undoubtedly keep this portion of the Macintosh market in a state of flux over the next few months.

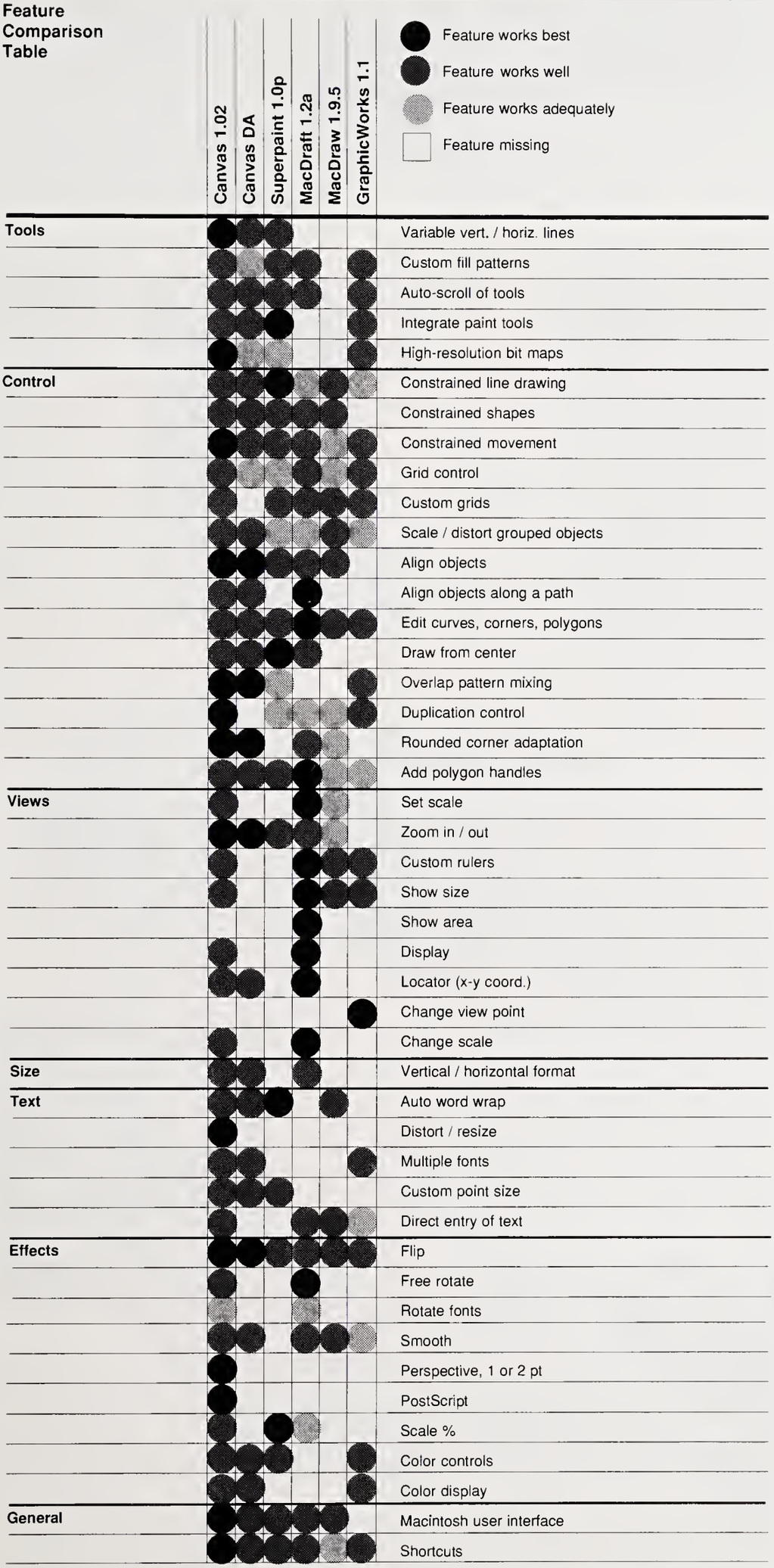
THE PERSISTENT QUESTION

Pixels, PostScript, or QuickDraw

Which of the three general categories of graphic programs is most appropriate for different user types? In my opinion, you need a PostScript program such as Illustrator or CricketDraw if you:

- Own or use a PostScript printer
- Occasionally use a Linotronic 100 or 300 printer

Feature Comparison Table



- Need precise control for graphic production including hairlines, rotated paths, or complex line paths
- Need the ability to edit the programming code generated by the software

You would be best off using the simple and inexpensive paint programs like FullPaint, SuperPaint, or GraphicWorks if you:

- Use an Imagewriter
- Have no need to use a PostScript printer
- Occasionally use graphics programs
- Rely heavily on clip-art
- Need complete control of all dots on the screen individually
- Need to print in color on the Imagewriter II
- Do not use text extensively within the program

If your graphics requirements are not very restrictive or if the limitations of QuickDraw don' t concern you, then any of the object-oriented programs reviewed in this article could be useful. To narrow your choice down a bit, consult the feature comparison chart and pick out the features that are important for you.

Canvas 1.02 and the Canvas DA 1.0
Suggested retail price: $195 for program and DA; $99.95 for DA alone
Deneba Software
7855 N.W. 12th Street, Suite 202
Miami, Florida 33126
(305) 594-6965

MacDraft 1.2b
Suggested retail price: $269
IDD
2280 Dates Avenue
Concord, CA 94520
(415) 680-6818

MacDraw 1.9.5
Suggested retail price: $195
Claris
440 Clyde Avenue
Mountain View, CA 94043
(415) 960-1500

SuperPaint 1.0p
Suggested retail price: $149.95
Silicon Beach Software
9770 Carroll Center Road, Suite J
P.O. Box 261430
San Diego, CA 92126
(619) 695-6956

GraphicWorks 1.1
Suggested retail price: $149.95
MindScape, Inc.
3444 Dundee Road
Northbrook, Il 60062
(800) 221-9884

First Contact

John Odam

1. Logo for a software company. The stroke is screened 50 percent and filled with black.

2. Divider page for a study guide to a home-study English course on audio tape, marketed in Japan. The different tone values were added in the printing stage in different colors keyed on an overlay.

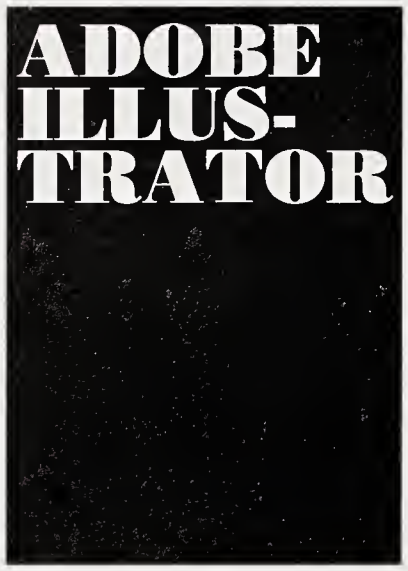
3. Geological diagram for an earth sciences book. The original art was created in MacDraw and then upgraded to Adobe Illustrator once that application became available.

4. Bug for a catalog for an adventure travel company. The type was first proofed in PageMaker and pasted into a circle by hand. I then knew where to place the letters using Adobe Illustrator and how much to rotate each one.

I was excited when they told me that *Verbum* 's copy of Adobe Illustrator had arrived. We had all seen the beautiful examples in the ads — the golfer, the car cutaway, the gingerbread house, and the eagle — and I was looking forward to one of those pleasurable evenings or weekends of methodically exploring the possibilities of a new software. But this was never to be. In the mad rush to get various jobs out, I found myself reaching for Illustator as a "quick and dirty" way of getting some rather mundane things done.

The beautiful packaging and thorough manual indicated a software of quality and pedigree. The demo disk and video were helpful in getting across the basics of Illustator. My encounters with Fontographer had made me familiar with PostScript software, and in one evening, with some help from Jack Davis, I drew a plane profile and proofed it on my laser printer. Apart from some difficulty in negotiating the transition from a curve to a straight line, I thoroughly enjoyed the graceful dance of the pen tool as it performed its arabesques. Unfortunately, that one evening drawing the plane was the only training flight I had time for. From here on I was flying solo.

It was one of those awful rush weeks when I had only two days to produce nine double-page book section opening illustrations, with absolutely no art budget. I booted up Adobe Illustrator, scanned in the line art bases of selected illustrations within the chapters, turned them into black silhouettes, outlined some of their internal details in



white, and blew them up huge in PageMaker, producing a sort of block print effect. Each drawing took about 30 minutes. Specifying the colors for all the outlined areas took much longer.

Next a shower of logo jobs fell upon me, and I found myself cranking out large numbers of relatively simple icons in record time. I learned how to stack multiple layers of shapes in different line weights and fill densities to create a neon effect. And so it went, as I picked up tips on how to do it on the fly. (Adobe's publication, *Colophon*, was extremely useful.)

1

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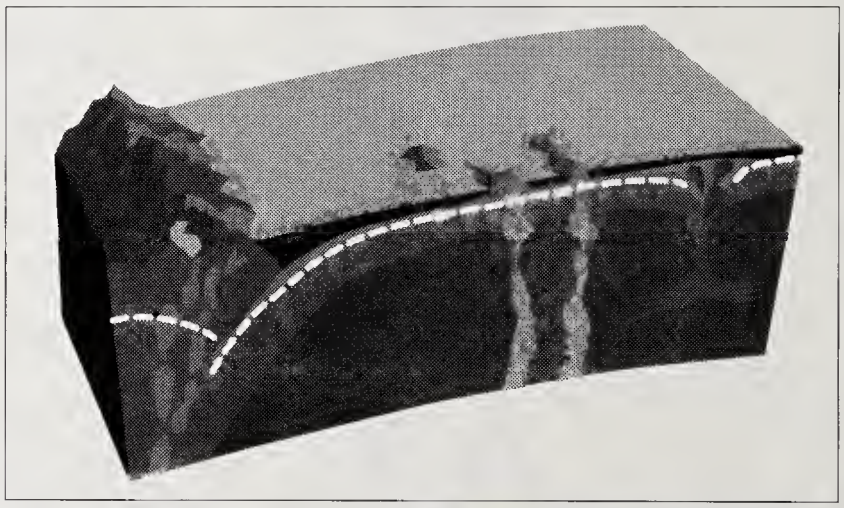


3

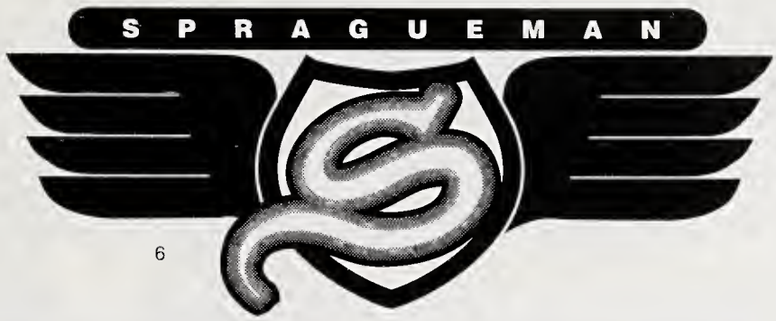
Intrigued with the color menus, I resolved to try a color illustration. The results of the experiment appear on page 27. For those of us who love technical art but hate inking, Adobe Illustator combined with the Linotronic printer is the answer. For the kind of complex detail work shown in the Adobe's advertisements I doubt that the Illustrator–Linotronic combination does the job much faster than ink, but I think it does the job better.

Finally, what's fascinating about Adobe Illustrator as an art medium is how utterly different is the artwork that emanates from the mice of various artists. And that is the hallmark of a truly versatile software.

4

5. Hypothetical poster using the color menus in Adobe Illustrator. The mixes of tints are called out on the art.

6. Logo for a synthesized jazz ensemble. The neon effect is obtained by stacking clones of the same letterform in layers of decreasing density and line weight.



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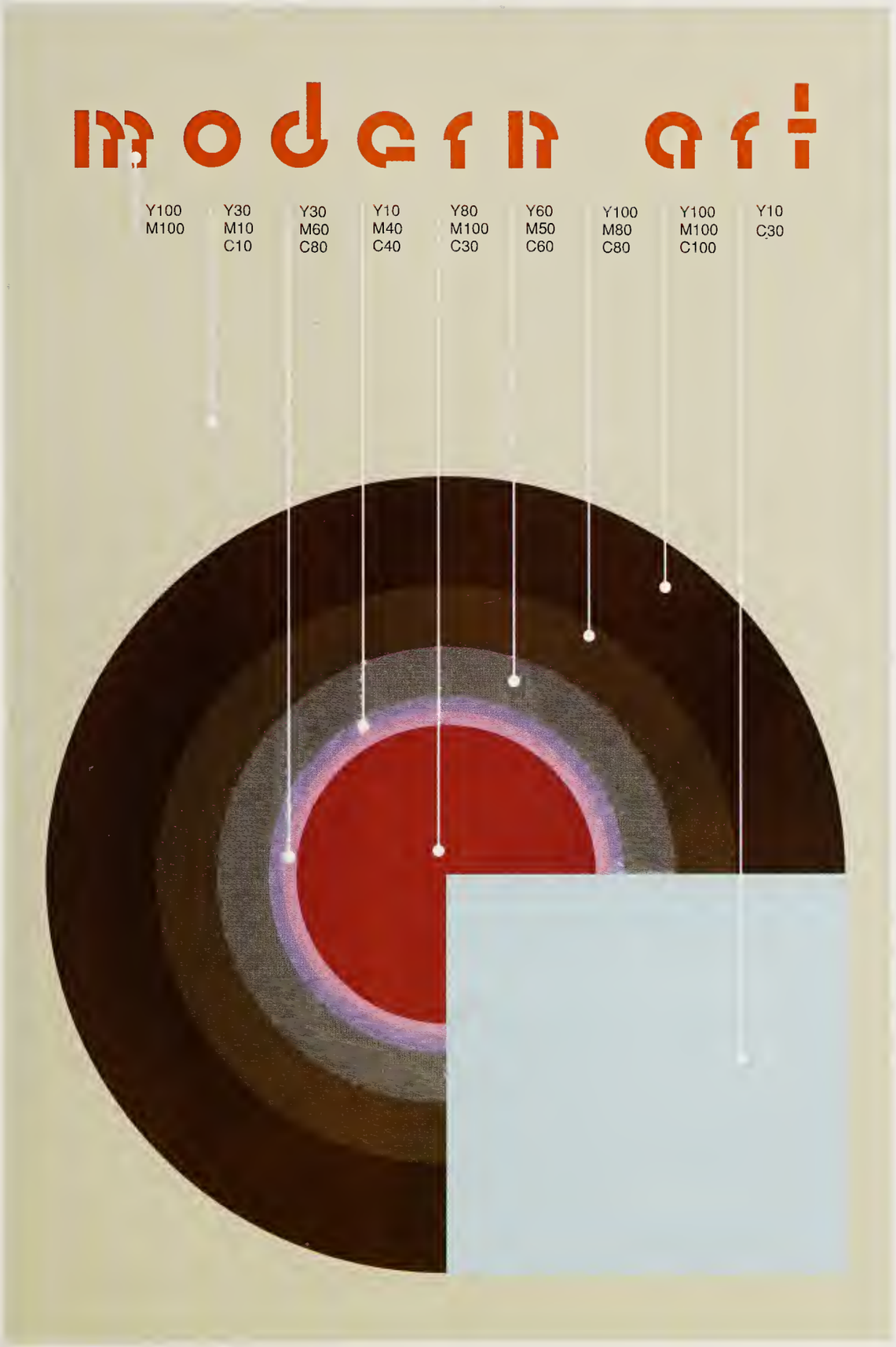

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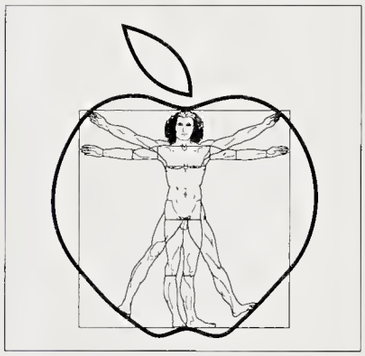

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7. Logo for a midwife. The regular type has been fattened to demibold by increasing the stroke width. The swash A was created from scratch.

8. Bug for a seminar brochure, "Ways to Influence the Elections in 1988."

9. Logo for Educomp Computer Services. This rendering of the Leonardo da Vinci drawing by Richard Carter demonstrates the fine line technique that Adobe Illustrator makes possible. The Flatness control is set at 5 to expedite printing without noticeable loss of definition.

Graphic Artists...Creative Geniuses... and Aspiring Artists...

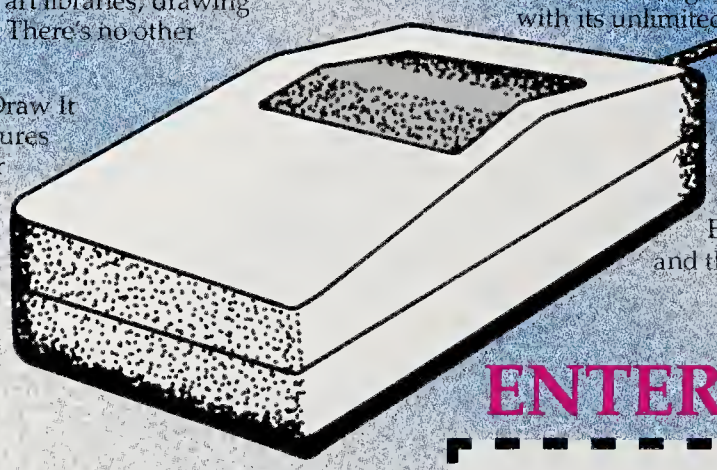
Win A $10,000 Mac II Package!

Announcing the "Draw It Again, Sam..." Graphic Arts Contest

If you've been waiting for your big break in graphics your time has finally come, thanks to Aba Software, the creators of "Draw It Again, Sam."

It's the only drawing program that gives you up to 10 layered drawing planes, limitless text and art libraries, drawing modes, and full paint capabilities. There's no other drawing program like it.

To enter, just take your copy of "Draw It Again, Sam," demonstrate its features the best way you can, and let your imagination go!



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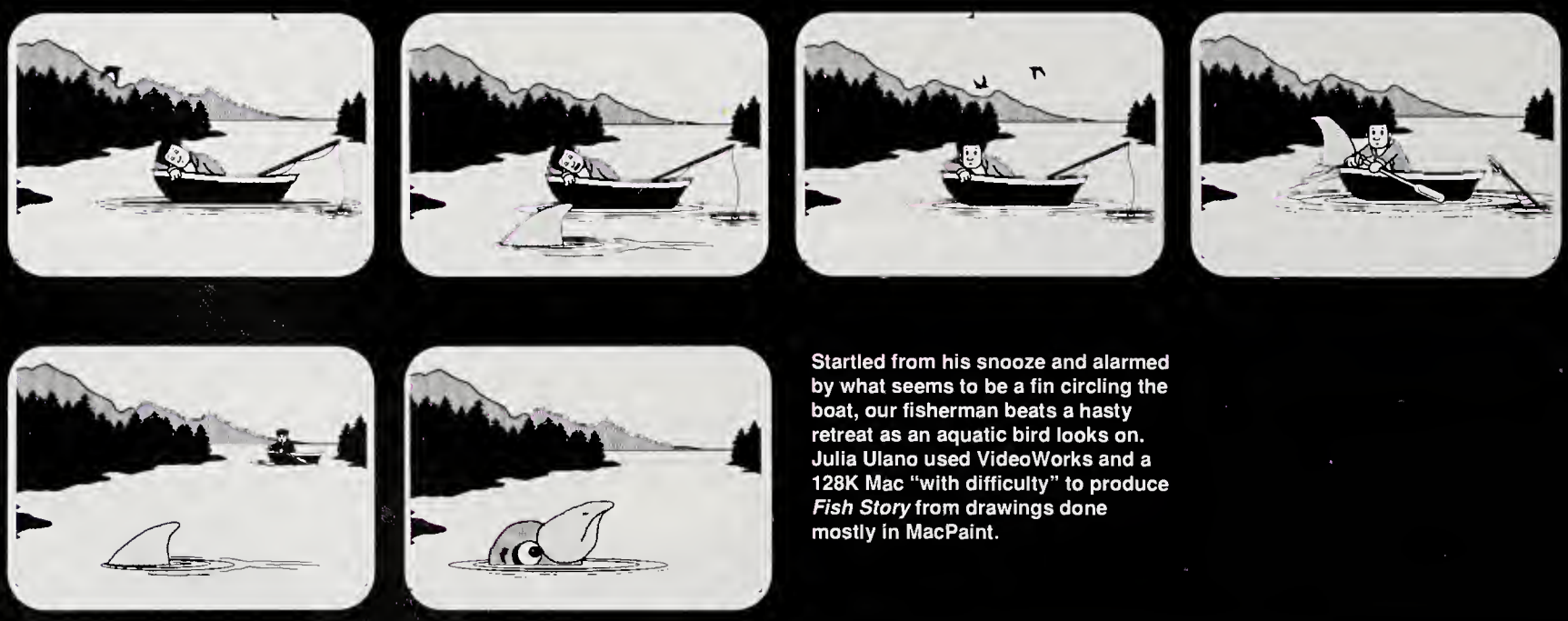
VID

■ *by John Foust and Linnea Dayton*

Stuart Sharpe used VideoWorks II and the Mac II to produce these two demos for MacroMind.

We take a short trip through the mind of one video artist. Ben Shedd used a video-digitized self-portrait and a figure provided in the VideoWorks art collection to produce *Ben's Brain*.



Startled from his snooze and alarmed by what seems to be a fin circling the boat, our fisherman beats a hasty retreat as an aquatic bird looks on. Julia Ulano used VideoWorks and a 128K Mac "with difficulty" to produce *Fish Story* from drawings done mostly in MacPaint.

E O S

Desktop video. DTV. Is it video that runs on your desktop? Or animation and special effects you create on your desktop to run on a TV? Or something else? Yes. As far as we're concerned it's all of these.

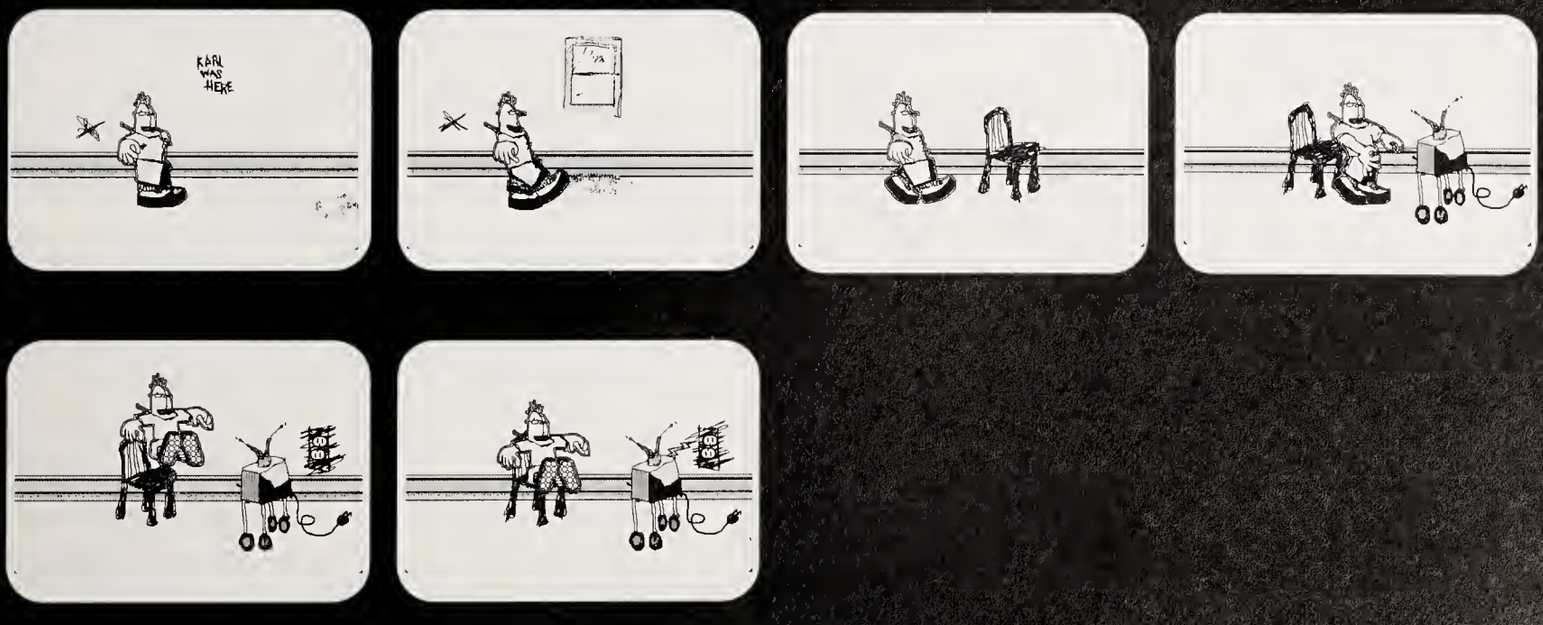
Running on the Desktop

The black-and-white "videos" on these four pages are virtually pc antiques — some of the first animations created with the VideoWorks program to run on a desktop Macintosh. The color frames are new, created on the Mac II with VideoWorks II. The pioneers who created these works have moved on to bigger an better DTV endeavors, and you'll see more about them in *Verbum* later.

Running on TV

The most common video graphic is a computer image superimposed on another video signal. Two examples of computer graphics on television are the credits at the close of a show and the clouds moving across a weather map. A device called a genlock synchronizes and joins the computer-generated signal for the text or clouds and the live video signal. Video titling is a booming business in the desktop video field. Today an artist using videotape no longer needs a studio full of expensive equipment to create special effects and graphics. Amiga, Atari, and Mac II can provide the same results. PC systems can achieve both home video and broadcast quality results.

Meredythe Dee, whose work appears in this issue's "Gallery," used Deluxe Video 1.2 and an Amiga 1000 to add targets to an interactive video game. Dee and her associates also use the Amiga for more traditional titling, animation, and special effects tasks. Lester Rottsolk stresses the importance of knowing and using all the paint and animation software you can get your hands on, learning what features work best in each and how to integrate the results of several programs. "You have to know the software almost better than the software developers do," he says.



After a long walk through his house, our hero settles in to watch the telly, which attracts an electrical receptacle that shoots out the necessary juice. We found Karl Hauser's *Weirdness*, created with VideoWorks, in the public domain collection of Educomp Computer Services.

"The developer had certain ideas of what the program should be able to do. The user may see possibilities for making it do something beyond what the developer imagined."

Sculptor Mark DiSuervo's welded steel works will be featured in a five-acre display called Socrates Sculpture Park in Long Island City. Mission Graphics Support in New York City is producing a video of the park's construction using an Amiga with modelling and animation programs, videotape recorded with a hand-held camera, and genlock and re-recording to combine the results of both. The video of the creation of the park will use other special effects — computer animation will be mixed with time-lapse images of the field, and video images of the real sculptures will be blended with computer-generated sculpture images.

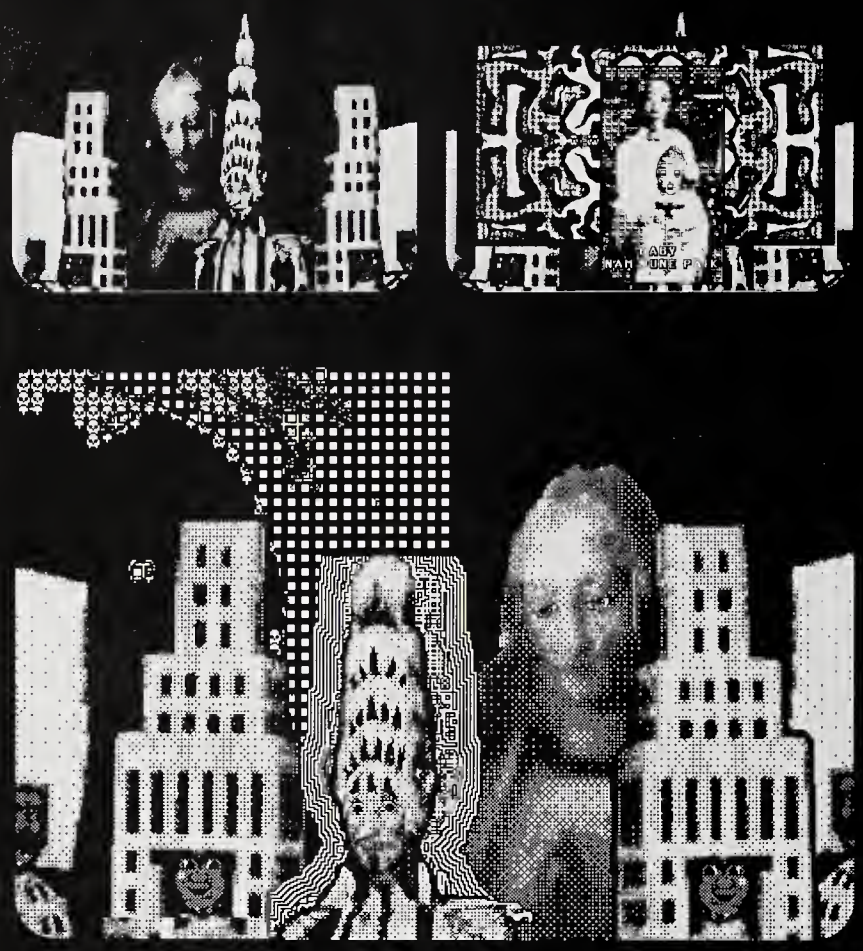
Running Wild

And what else might DTV be? Vince Billotta, president of Mission Graphics Support, puts artists together with technology. In his studio he introduces artists to the Amiga. The response has been positive and exciting. Artist Sandra Fillipucci used the Amiga's video capabilities on October 10 of this year in her gallery showing, "Digital Monotypes." She created video art in front of the audience, using a number of hardware and software tools to alter images on the screen.

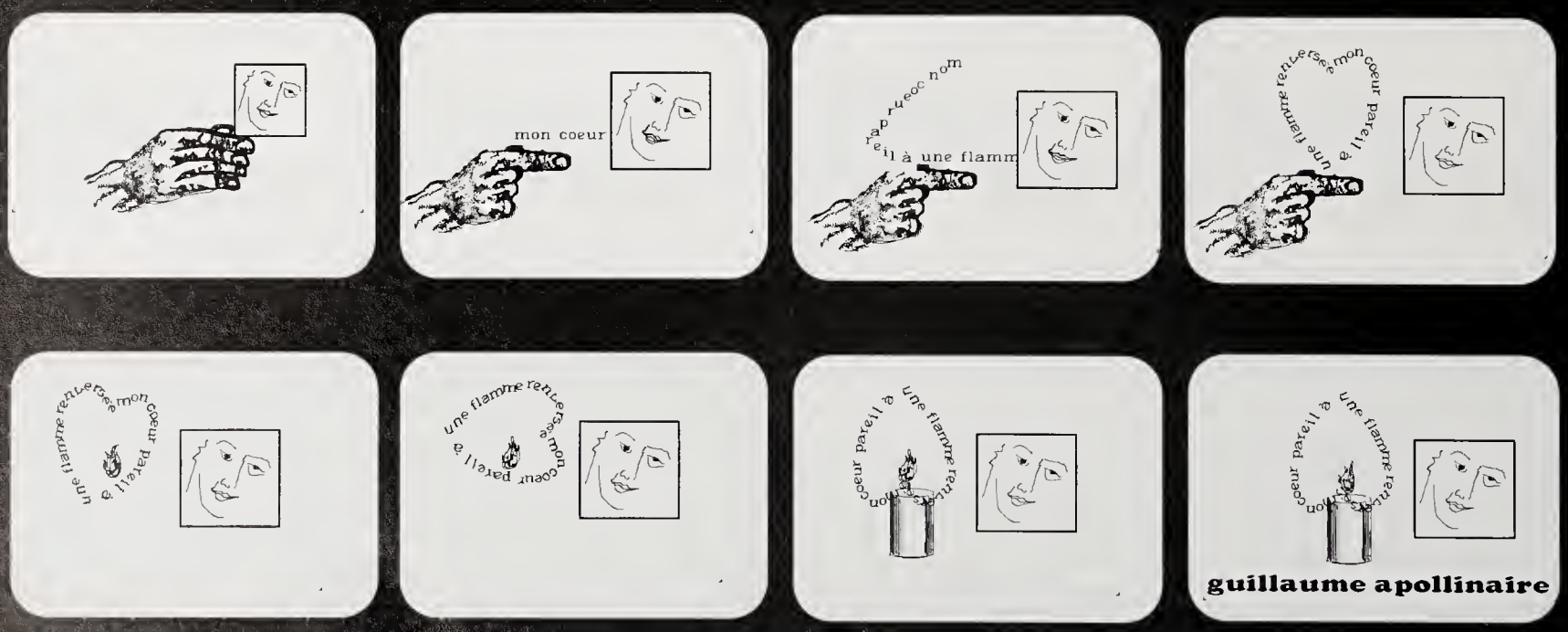
Southern California artist, teacher, and software developer Howard Ganz provides the basis of a design and then watches his artwork "grow" on screen as his own software package takes over and generates lifelike forms.

Enjoy the videos on these pages, and look for more from these and other artists in future issues of *Verbum*.

A growing, shifting collage of images in mixed electronic media, What-Zit was created by Joseph Prieboy using MacVision, Magic, and VideoWorks. Famous faces appearing in *What-Zit* include Nam June Paik and William Van Allen, designer of the Chrysler building..



James Bierman's *Apollinaire* is a lovely animation of a poem by Guillaume Apollinaire, spoken and displayed in French.



James Bierman produced *Waterloo* complete with maps, appropriate music, fades, wipes, and dialogue in French with English translations. This three-minute VideoWorks synopsis of Waterloo and the events leading up to it was created using VideoWorks and images and verse from Pollock's *Toy Theaters*, published in 1811.

Napoleon Bonapart's troops advance toward Brussels

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They intend to annihilate the Prussians at Ligny, but need cavalry to keep them from escaping.

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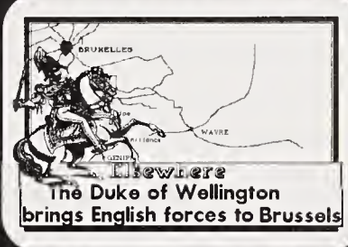
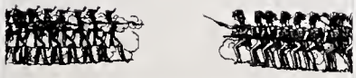
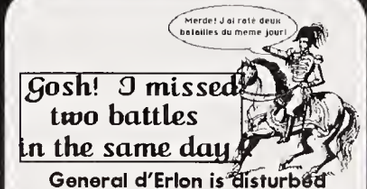




General d'Erlon is disturbed by the events.



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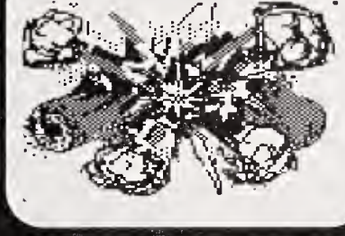
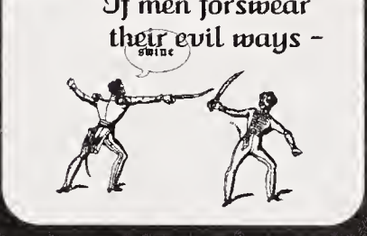




Are loyal, kind and good and true –

Are loyal, kind and good and true –

Then angels will scatter the legions of Hell

And Satan meet his Waterloo !

CONTIN

■ *by Linnea Dayton*

From inside the house "Connector" heard her coming up the front walk, so he motored over to the door and opened it for her. He'd been programmed to recognize her footsteps and to signal the close-and-lock mechanism to release. She didn't really need him to open the door for her. If she had touched the electronic lock plate, it would have recognized her fingerprint and opened the door automatically. But she let him open it, because she liked being greeted at the door, welcomed home, even if by a metal and plastic droid.

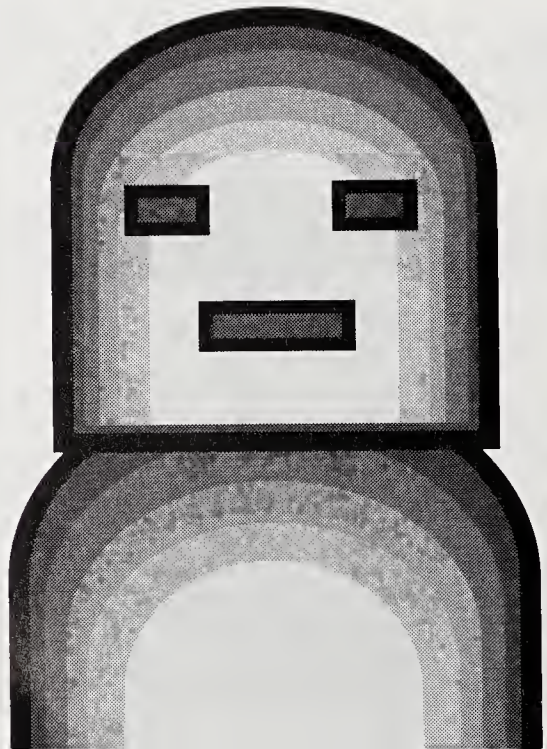
Connector was one of the early models in a series of "robotic helpers." The first helper unit had been invented five years ago by a 20-year-old electronic genius named Dave, whose independently wealthy parents had raised him in two-week segments at timeshare condominiums worldwide. Their idea had been to show him the world, but he had spent all of his time hacking and tinkering within the remarkably similar interiors of the 26 condos. He had invented the robotic helper to take care of his parents and had then set out to see the world in earnest, on his own. But not before selling his robotic helper patent to a company that subsequently made piles of money modifying its software and selling the units as "sitters" for older folks whose adult children were too busy to spend time with their parents. Commentary in the press as the first helpers went to market had decried the coldness and social isolation of this approach to solving the problems of a population whose median age was inching ever upward. But as the helper industry grew and third-party developers put a great deal of time and effort into analyzing the needs of the elderly and meeting them through software for these droids, social concern and understanding had expanded, and intergenerational warmth had increased rather than decreased

As Connector opened the door, she saw his familiar antique beige countenance peering out from under the furry being riding in the cat-catcher above the heat vents at the top of his "head." The cat-catcher had been her invention, and patenting and marketing the concept had brought her enough money to keep her comfortable for the rest of her life. (Because of his wandering lifestyle, inventor Dave had grown up without pets. So he wasn't familiar with the way older folks like the company of cats or the way cats are attracted to sources of warmth. But she had seen the potential problem right away: cat, attracted to warmth, sits on droid's head; heat, not to mention cat fur, builds up inside; droid malfunctions. And thus the invention of the cat catcher.)

She had considered ordering Connector with an opalescent finish, but had decided it cost too much. She had also rejected the "anthrotone" finishes, those pliable "skins" in various shades designed to make the service droids look like friendly, supportive, lifelike, if not quite human, beings. She had rejected anthrotone not only because it was expensive, but also because she wanted to be reminded every time she looked at him that Connector was a machine, not a real person. Anyway, the beige matched the antique 128K Macintosh that sat on the pedestal in the corner and still functioned perfectly when the occasional neighborhood child stopped by to play with the 27-year-old curiosity.

"Hello," he said in a very humanlike tenor voice. "Did you have a nice walk to the drug store?" (While she was determined not to humanize this robotic helper, the quality of his voice had nevertheless led her to think of him as male.)

The question he had asked was part of his built-in repertoire of queries, statements, and cautions, along with:



"The mail came. Would you like me to tell you about it?"

"Did you take your pill(s) this morning?"

"Shall I put the trash out now?"

"Your news subscription is about to expire."

and "Would you like me to reconstitute something for dinner?"

"Yes, thank you," she replied to his question about her walk. "It was just the right amount of exercise, and I got the vitamin C I wanted."

She didn't have to speak politely to him like this. One of the optional functions of robotic helpers was to provide verbal "whipping boys" for the embittered. But she wasn't bitter, and she enjoyed civility.

It was easy for her to be civil to Connector; she had adapted him to suit herself. She had deleted many of his standard messages; for example, all those having to do with food service. She liked to prepare her own food, mostly from the produce she raised in the small yard she had reclaimed by razing over half the structure of her housing unit and exposing the topsoil underneath. Although the housing units were densely packed here, they were only two storeys tall. So natural sunlight was able to reach her garden many hours a day. She had replaced Connector's stock small wheels with larger ones to protect his workings from the dirt so he could "read" to her, play music, or converse while she gardened. His conversational ability depended on the 100 MB 1-1/4-inch microbubbles that plugged into his 24 information ports. The news service delivered a new bubble (and picked up the old one for recycling) every other day.

"What's new?" she asked as she closed the door and he rolled ahead of her into the ground-level mechanical room of her two-room house. This "Downstairs" room contained all the metal and plastic machines responsible for the day-to-day workings of her life — the air conditioner, water filtering and reclamation unit, electronic entertainment center, kitchen, laundry, and bathroom facilities. "Upstairs," ten feet up a real wooden ladder that the aged carpenter had been reluctant to build, thinking it too steep for her elderly bones (he had underestimated her), was her bed-sitting room, with cotton-upholstered wooden furniture, Navajo and Peruvian tapestries, books printed

U U M

on real paper and bound with cloth, and windows that opened, right into the branches of the eucalyptus tree that had persisted through drought, flood, and subdivision.

He answered her question as he was programmed to do, listing all the "connections" he had made for her since the last time she had asked. "I paid electronic bills — water, air purification, garbage collection, energy, postal service, and telecommunication. The tax bill did not agree with the corresponding meter in my protected data area, so I sent a request for clarification. I scanned the video shopping channel. I ordered orange juice, cranberry juice, milk, eggs, cheese, chocolate, and diet cat food."

"Very good, Connector. Thank you," she said, as she lifted the cat out of the cat-catcher and patted Connector's "shoulder." The droid almost sighed aloud with relief at the removal of the weight. "Was there anything from the postal service?"

"Yes," Connector replied, "your *Verbum* arrived. It's on the table."

She picked up the small, thin gray envelope and opened it. Printed in black on the white paper inside was a map of the world showing time zones with a time listed in each and a wave pattern emanating from San Diego, California, U.S.A. At the bottom of the small page was printed,"*Verbum 25.4* will be broadcast to subscribers daily from December 10 through December 15 at the times shown on the map. Tune to Channel 487 on your video at these times for the sound-and-light inducer pattern." The message was repeated in Spanish, French, Japanese, Arabic, and Esperanto.

This was the first issue of *Verbum* to be presented as neutrinoware. Neutrinoware had had a long evolution. Neutrinos, the subatomic particles without measurable mass or charge that travel at or near the speed of light through solid matter, had been known for years, of course. Because they could penetrate anything without damaging it, neutrinos had long been investigated as a medium for transmitting information. In 1989 researchers at the Center for Parapsychological Studies had discovered that certain people and animals with high concentrations of radon in the brain — for example, people who had purposely exposed themselves to radon in the 1930's as part of a then-current health fad — were unwittingly using neutrino streams for communication. As research continued, it was found that radon itself was not essential for neutrino communication. The radon merely elicited a brain wave pattern that could channel neutrino streams to store or release data. The ability to generate this brain wave pattern seemed to exist naturally in some individuals, and with mental concentration coupled with exposure to a particular pattern of sound and light, almost anyone could be trained to produce the appropriate brain signal. Neutrino communication had been shown to play a role in the striking similarities between twins separated at birth and in certain telepathic experiences, ghosts, and poltergeists. It was currently being investigated as the mechanism for karma. Once neutrinos had been channeled for communication and the safety of this process had been established, ideas for neutrinoware had appeared in profusion. Only two years ago the technology for mass communication by neutrinoware had been perfected, six months ago the transmission system put in place. *Verbum* was one of the first journals to be given time on the network.

She was excited about this first neutrinoware edition of *Verbum*. It was already December 12, so she could experience *Verbum 25.4* today and for three more days. She was quite sure she wouldn't be disappointed. There had been few disappointments in *Verbum's* 25-year history, as the journal had taken advantage of the media that became available. The videotape produced in 1988 had been a great success, as had the compact disks, satellite video broadcasts, and holographic manifestations produced later. Once the Universal Personal Computer Disk Drive and Operating System, allowing users to use any pc disk with any pc system, had become available in 1991, many well-received issues had been published on disk. However, as an early member of the *Verbum* team, she vividly recalled the few issues that had resulted in disappointment. There were the "temporary" tattoos in 1988, designed by a leading tattoo artist and issued as four pages of "ready-to-apply" artworks. There had been a mix-up at the printer, and a permanent rather than temporary transfer ink had made its way onto the ill-fated pages. Most subscribers were good-natured about it, but some became irate when the designs they'd used to embellish various parts of their body for a party couldn't be removed with soap as advertised and had to be worn day and night until they finally faded into nothingness two months later.

Then there was the multimedia "Yuppie Nostalgia" issue in 1999. Issued as a vinyl-bound organizer notebook in shades of mauve, taupe, and plum, it contained a universal disk, video disk, and taste wafer. The CAD wire-frame image of the 1986 BMW had turned out well. And the video of the pet French Angora rabbit wiggling its nose had been a success. The musical score has been well chosen, from Pachelbel's *Canon in D* to selections from George Winston's *Winter* album. But the taste wafer had been a spectacular failure. Once again the printer had messed up. Instead of producing four separate wafers whose flavors would have evoked the best of the yuppie era, the shop had mixed the brie, raspberry vinaigrette, sushi, and Cajun blackened catfish in one wafer. Not very nice.

As the time for the sound-and-light broadcast approached, she turned on her video set, and sat down in front of it with the cat on her lap. (Cats were very good at receiving neutrino communication, as had been discovered when someone had researched their ability to walk into a room, identify the person who was most allergic or who most disliked cats, and sit on that person's lap.) The sound-and-light pattern appeared on the screen for 30 seconds. She took it in as she concentrated her mental energy. As the neutrino broadcast began and *Verbum 25.4* began to fill her mind, she certainly wasn't disappointed. The artworks were wonderful in a way that only neutrinoware could be. The music segment seemed to fill her entire mind, body, and soul. There was even a short science-fiction piece. It reminded her of one she'd written at the last minute to fill in for the article about digital scanners that had been slated to appear in *Verbum 1.3*. "It's the wrong time for a scanner article," the writer had said. "There will be some great new scanners coming out just after the first of the year. And besides that, I'm a procrastinating perfectionist." So, to fill in, she had written the only two pages of sci-fi she ever produced.

■ *Jack Davis*

Image ination Studio

Another program to make the visual artist's eyes water. But what is it? Computerized Darkroom? Digital Airbrush? Electronic Charcoal?

ImageStudio from Letraset (the program that has single-handedly sold thousands of Mac II's by its capability to display beautiful continuous-tone photos) is far more than a gray-scale photo touch-up program. ImageStudio holds incredible promise as a workhorse for both fine and commercial artists. (And who of us is not a touch of both, anyway?) ImageStudio is elegantly designed and filled to the gills with features. I have yet to scratch the surface of its creative potential.

You're going to see dozens of detailed reviews in your other magazines, so I've decided to let the "output" speak for itself and to provide a few insights on capabilities and techniques.

Unfortunately, I didn't have access to a gray-scale scanner for most of the foundational scans. If you're planning to do professional-quality (someday we'll have a consensus on what that means) halftones, by all means save up for a scanner that supports true gray scales, even if it provides limited grays. As you can see by some of the examples, ImageStudio takes dithered, non gray-scale TIFF images and converts them beautifully to pliable gray scale, but with the obvious loss of detail caused by the fact that bit-mapped scanners need to use a minimum 6-by-6 pattern of dots (out of the 300 dpi) to define a shade of gray, whereas gray-scale scanners can do the same with one dot.

But no matter what the source, or even if you have no source at all and just start painting on a blank screen, you'll find ImageStudio to be an indispensable and incredibly imaginative tool.

The ability to lighten, darken, change contrast, and so on in specified areas, allows a tremendous amount of flexibility in molding an image. In "Stroke Eyes" below, a section of a background (created with a Defined Fill Pattern originally from Thunderscan) was muted and darkened to give the impression of a shadow.

The soft drop shadow below the "Image ination Studio" headline was achieved by laser printing the type, scanning it in as a 72 dpi bitmap, bringing it into ImageStudio, and then blurring and lightening it. Next I saved it as an EPS file and brought it here into PageMaker as we did with all the other images.

The halftone screen for all the images on these pages was changed from the printer's default from within ImageStudio to a 133-line screen at a 45° angle. Since the L-300's RIP couldn't handle this 4000K page spread, the images were run separately as negatives at 2540 dpi while the text was run on normal resin paper at 1270 dpi. The negs were then stripped in place.

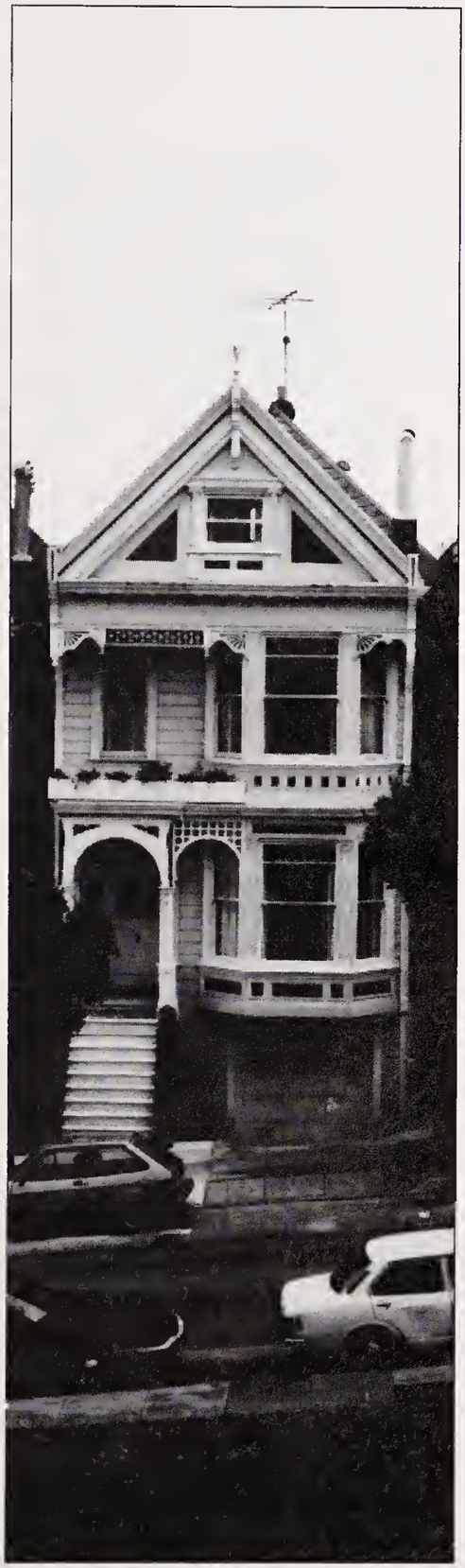
This image, a birth announcement for "Charlie King," started as a muddy, low contrast 3"x 5" color print that was then ThunderScanned. The original ThunderScan file (not the new Thunderscan TIFF file) was brought into ImageStudio and "feather-edged" with the FingerTip tool.

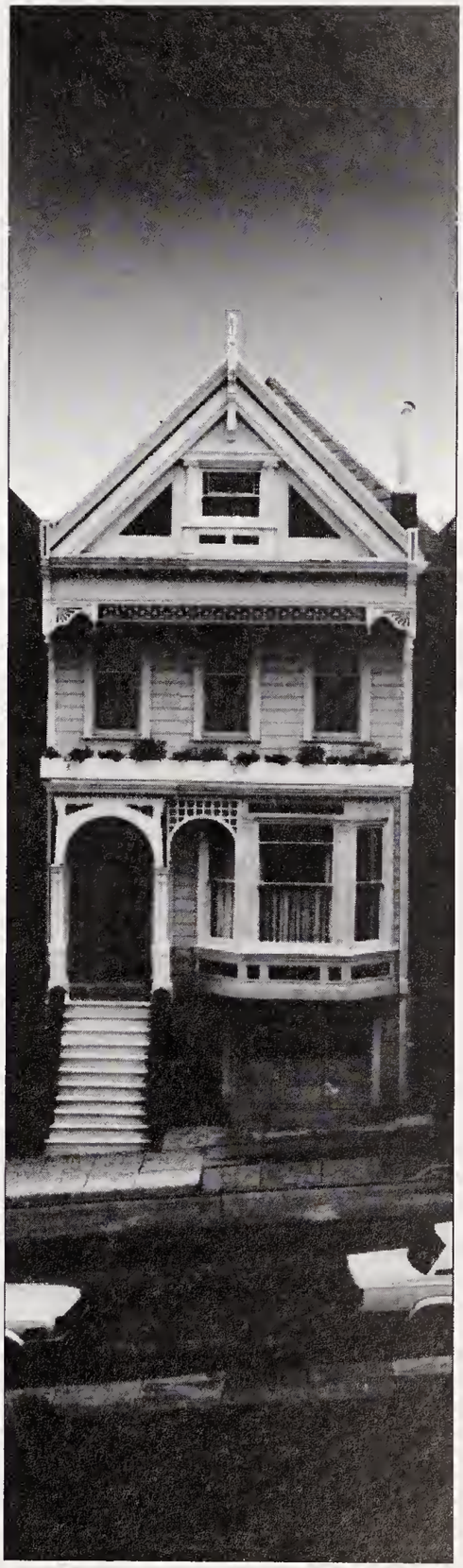
If you don't have a gray-scale scanner (or even if you do), here are a few tips on maximizing the final image. Always use a "Sharpen" filter once or twice on the foreground of a picture to bring up the detail a bit. I also always run a "Soften" filter on the background to decrease the apparent depth of field. Also, if a portion of your image can be retouched to take advantage of ImageStudio's full range of 65 grays (as opposed to most scanners' 16 practical shades of bitmap dithered grays), do so (see, for example, the "Gradated Fill" background sky on the Victorians below). The "SpaceBoy," on the left, scanned with a Microtek MSF 300-C, shows cutting and pasting from one image to another and some retouching on the helmet to match the background photo's light source.

OK, so you want to make some *typical* changes to a scanned photo – see if you can find the 537 or so differences in these two "Victorians." Here on this scan from a 16-shade gray scale Abaton, I didn't try to improve as much as to experiment with some touch-up techniques. When attempting to cover up a particular area, I found that rather than trying to match it freehand, it was easier to Lasso/Option/Grab an adjacent object or texture and move it into place. And when trying to blend after such a touch-up, there are several possibilities: select the area with the lasso and run either the Soften or Defuse filter on it. Or you can use the Water Drop to blend the points of contrast, or the Finger Tip tool to smear between the two areas.

Don't have a Video scanner? Who says a 3D image can't be put on a 2D flattbed, especially if you have willing victims such as "Geno & Leah."Scanned on a Microtek MSF-300C flatbed (see the cover to appreciate the difference of Microtek's new MSF-300G, true gray-scale scanner) with some blurring to minimize the banding between gray levels.

For those of you with a Video camera, MacVision will be coming out soon with a gray scale option. The "SelfPortrait", below, was created by combining images from MacVision in a Beta version of ImageStudio that allowed you to run the video digitizer from within the program, thus skipping the bit-mapped stage.





Tales of the Trade Shows

■ *Kim Criswell*

In the computer industry, the world seems to spin so fast you can hardly keep up with it. What you see in the magazines, the ads, the dealerships, the trade-shows — it's all a facade. We try to look cool, collected, on top of it all. What we hope you don't see is the frantic, workaholic madness that led up to the finished product. It's a sick life, but endlessly fascinating. Even fun.

We're deadline driven, of course, and the big trade shows determine a lot of the deadlines. The shows are generally perceived as good places to introduce new stuff — products, ads, attitudes — because they provide such a large, nearly captive audience. Even if there's nothing new, trade shows offer the chance to plan for and promote alliances. And catch up on everyone else's news.

Getting Ready for the Biggie

As this goes to press, industry insiders are gearing up to put the final touches on Comdex plans. Comdex (Computer Dealer Expo) is the biggest show of the year. It lasts a whole week and takes over the entire city of Las Vegas. Repeat Comdex customers — long-established companies like IBM — have the good fortune to set up their huge displays in the Las Vegas Convention Center's Main Hall, where most of the traffic is, most of time. Second liners, the newer companies that plan ahead and can afford respectable-size booths, end up across the street in the West Hall of the Las Vegas Hilton. Smaller, poorer, newer, or less savvy companies show their stuff on the outskirts of the action, in various hotel ballrooms scattered along the Las Vegas strip. Sometimes that's where the newest, most "gee-whizzy" products debut, if you know what to look for. There, or in hotel suites by private invitation.

Airlines and hotels sell out months in advance. The exhibitors' stress level starts mounting months in advance. And the show can make or break a new company. (Last year my own company took a risk by spending about 10 percent of our venture capital on Comdex. It put us on the Silicon Valley map. It even made our founder a millionaire: a board member of the company that eventually bought us discovered TOPS at Comdex.

So Comdex is an important show, and networking is the name of the game. Both kinds of networking: electronic (you've seen all that hype about the year of the LAN, right?) and social.

The company that pays my bills stated in a recent ad that "our goal in life is to connect everything to everything," because our product, TOPS, connects different kinds of computers. It lets you mix and match Macintoshes, PCs, and Sun Workstations so you can do your socio-electronic networking and still maintain your individuality.

At this year's Comdex, we'll be doing some socio-electronic networking of our own: we've teamed up with Hercules, the company that owns the PC graphics card market. They're adding TOPS networking capabilities to their card. If you use a PC with a graphics card and you want to print to an Apple LaserWriter or share files with other PCs or with Macintoshes, this will save you installation time, money, and an expansion slot.

The Other Kind of Networking

The purely social networking happens mostly at the parties. I'm still recovering from the last round, at a handful of trade shows last August and September.

It seems like the best party crowd goes to the Macintosh, desktop publishing, and graphics shows, while IBM-dominated shows have nearly *nada*. Big blues. On the other hand, the last Macworld Expo didn't live up to its wild and crazy reputation. Only one event was the talk of the town: the PCW Communications bash held at Boston's Metro Nightclub. It followed what looks like an emerging formula: hip, semi–new wave club environment; hot (but loud) Motown band; *lots* of people dancing and shouting (to be heard over the music). Most complained about not being able to talk, but many were disappointed when the place shut down at midnight — it could have easily lasted another two hours. The place was so crowded that half of us hadn't finished making our rounds yet.

When that party ended, there was mass confusion: "What'll we do now?" Those who were wise went home and to bed. The rest of us headed off to semi-private affairs.

One of these was writer Doug Clapp's. Billed as a "Jolt Party" (which tells you something about the refreshments), it was being held at an undisclosed location. You were supposed to be a good investigative journalist or really cool — or a friend of Doug's, I guess — to uncover the details. I was planning to go just to prove myself — I love a challenge. Unfortunately, the hotel management shut it down early because of the noise. Should've invited 'em, I guess, but they clearly weren't cool.

Another private party suffered the same fate — except that I made it to that one. The hosts, self-proclaimed "Desktop Partying authorities" Jack Hodgson and Ben Calica of the Boston Computer Society, were by far Macworld Expo's most creative. Despite a limited budget, they pulled off a theme event. Michael D. Murie (a programmer by trade) helped with the planning. He printed private invitations and the hippest buttons: a Mac with a martini glass and the slogan, "Ask me about Desktop Partying."

They adorned the hotel room walls with computer art. Not computer-generated art, but a series of acrylic paintings, with the Macintosh as their theme. My favorite was a mixed media piece: it looked as if someone had taken a Mac and hurled it onto the canvas, watching it burst into a million fragments of plastic and metal. Pieces of a hacked-up Macintosh were glued onto a bright, blood-red splash of paint on a white acrylic background — a broken mouse, a cord, part of a keyboard, disembodied keys. Murie admitted that mostly he'd used spare parts that Hodgson and others had collected with the fantasy of eventually building a computer from scratch. He did have to destroy a functional keyboard, though. He titled the destructive-looking piece *Creation*, adding, "You figure it out."

Honorable party mention also goes to Living Vidoetext/ForeThought/Presentation Technologies for their joint effort at the Four Seasons. They provided an

elegant atmosphere with real food and a real opportunity for people to relax and talk. Writer/editor Mark Seiden proved to be a talented pianist — just right for this toney affair. And to Computer Currents for partying at the Computer Museum and hiring hula dancers (but you'll have it *later* next time, right guys?).

The "Better Luck Next Time" award goes to MacUser. Last year their cruise was one of Macworld Expo's highlights. This year it was so hard to get tickets that no one wanted to go, because their favorite drinking pals weren't invited. Rumor has it that MacUser won't do a cruise again, so that they won't have to be so exclusive. Good idea, or maybe they should do a series of one-hour mini-cruises so people can come and go.

Macworld Expo wasn't the only source of good parties this season. Industry analysts Tony Bove and Cheryl Rhodes had a party at their home in the redwoods following a Santa Clara Desktop Publishing show. It was a nice injection of reality: Tony's and Cheryl's home offices are reminiscent of a west-coast branch of the Boston Computer Museum. And they have a great poster collection. A high-tech party in the woods is a great contrast — both inherently and compared to the usual, catered, polished hotel ballroom event. The guests seemed a little more real as a result. One marketing executive had everyone rolling on the floor by doing imitations of industry heavy hitters as if they were really comedian Bob Goldthwaite. (He's the one who shouts like a mad man, right? I mean, didn't I tell you we're all crazed?) Another was pretty visibly bummed: her Southern California company had been acquired, and apparently she hadn't been taken care of, even though she'd been an early member of the team. There were plenty of hackers, too, and hardly anyone wore a suit.

Trends You Can't Help Noticing

The trend in evidence at last January's Macworld continued this August: There were lots of well-suited, serious-looking businessmen. This fact continues to concern some of the original Mac-ers, but I say that the key to happiness is "Straddle that fence!" The suits are a sign of success, and success brings us additional and improved tools for our crafts. Besides, there are signs of hope. For one thing, the Mac market seems to include more influential women these days.

PC Expo, by comparison, sported anachronistic views: A woman's place was in a slinky dress, playing the bimbo. Seriously, I saw two booth dollies (in different booths!) attired as if they were in a more traditional profession (the world's oldest): one wore clingy, synthetic black with cut-outs in the back. Tacky, but I guess that's all her employer could rely on to draw people to the booth. I'd hoped that was a thing of the past. Sadder still, it wasn't even becoming. More big blues.

(Fantasy interview: "So tell me, sir, why are you talking to this woman? What exactly is she selling? And you, ma'am, are

you exploited by choice? How does it feel to be a bimbo?")

Macintosh shows are still full of true believers. Twenty-five-year-olds who start their own companies and plan to be millionaires by thirty. PR reps who think they're telling the truth. Hackers who think they can change the world — and maybe they can, if they're creative and bold enough. Technology that's accessible to the average guy.

Desktop Presentations is the newest industry buzz word. That and Hypercard-inspired "stackware." These categories overlap, and can include video- and slide-making capabilities. The addition of color screens for the Mac ought to hurry this genre along. It will make professional-looking presentations accessible to the less professional and less wealthy, just as desktop publishing makes newsletters easier for the little guys to produce. It'll make trade show talks more interesting , too. (Whatever works...)

Synergism and Then Some

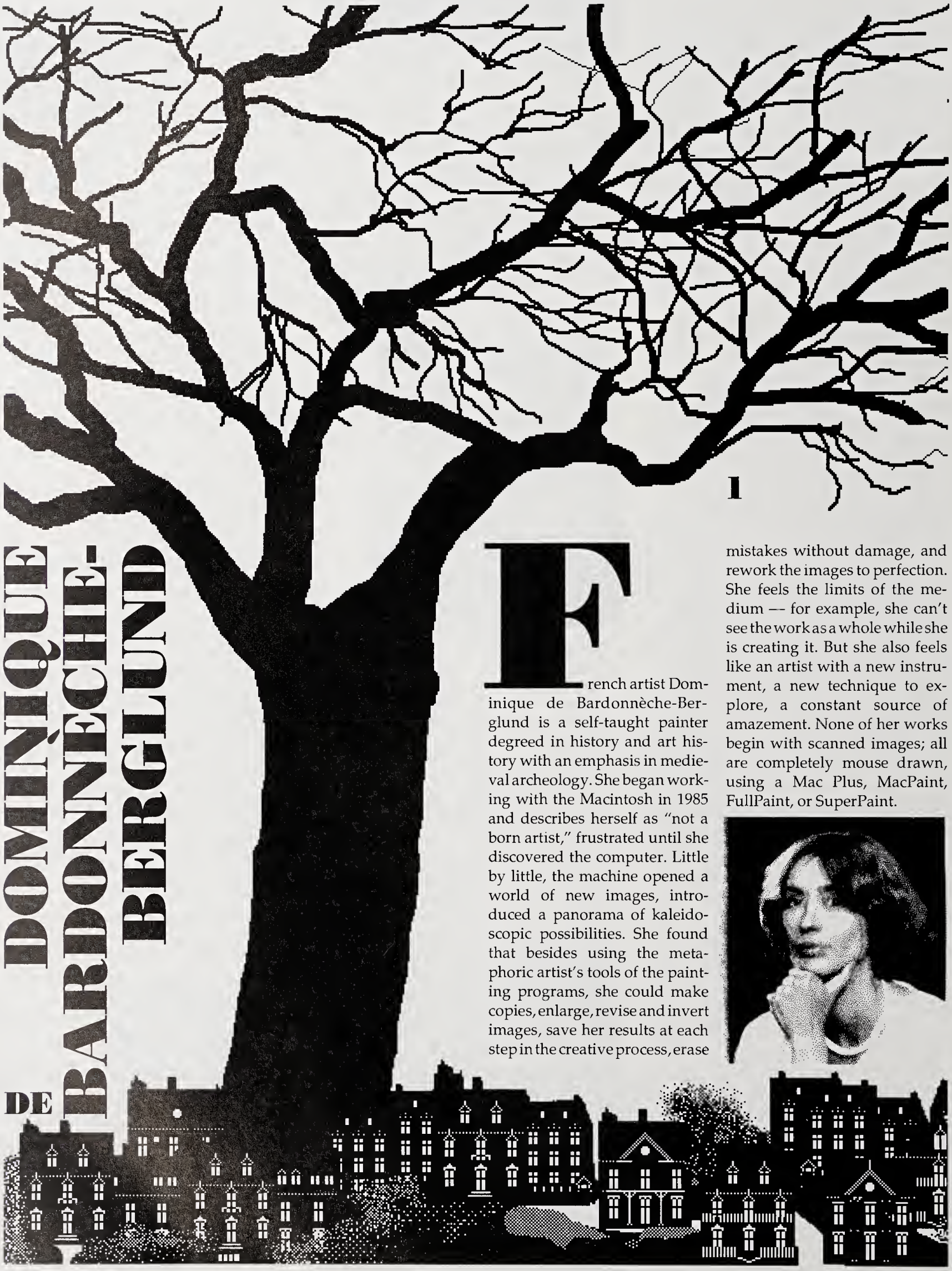
Last January at Macworld, Enzan-Hoshigumi introduced Mac Calligraphy. The product provoked an emotional response in many of its reviewers. Following the ritual of Japanese Sumi, the process begins with the electronic grinding of ink in an iconic ink stone. The quality of the painting (and of the experience) is determined by the amount of "water" added to the ink, by the size of the "paintbrush," and by the speed and consistency of the mouse stroke.

Now a new product, Lightgate's Felix, is making its way to market. It could be dynamite combined with Mac Calligraphy: A Felix is a mini-mouse, a second-generation or "post-mouse" input device. (So don't ask why, but their brochures are illustrated with a shadow version of Mickey. Get 'em while they last, because Disney sent them a "cease and desist" letter.)

A Felix is worth getting your hands on. Basically, it's an optical data tablet that takes up about 5 square inches of desk space. That's all, ever. Because within the 5 inches there's about a 2-square-inch "stage" on which Felix performs. Felix itself is tiny — 1/2-inch by 1/2-inch by 1-inch rectangular prism that you hold sort of like a pencil. It's amazingly sensitive to the touch, very fast, and instantly responsive. — which is what would make it amazing combined with Mac Calligraphy. Two physical, intuitive, sensual products, working together. The potential boggles the mind.

Or re-boggles it. My mind was already boggled when I saw tangible evidence of what these trade shows can lead to. At Macworld last January, TOPS president Nat Goldhaber bought a copy of Mac Calligraphy and sent it to an artist friend of his. The artist, Marius Johnston, responded by sending Nat the results — a series of framed prints that don't look like anything else I've ever seen come out of a Mac. Only one of the prints — a cover letter, actually, was done with Mac Calligraphy. The rest were produced using ThunderScan, FullPaint, and an ImageWriter II with a color ribbon. The results are haunting and mysterious, and reproduced in this issue's "Gallery." I can't wait to see more. Maybe after the biggie

DOMINIQUE DE BARDONNÈCHE-BERGLUND



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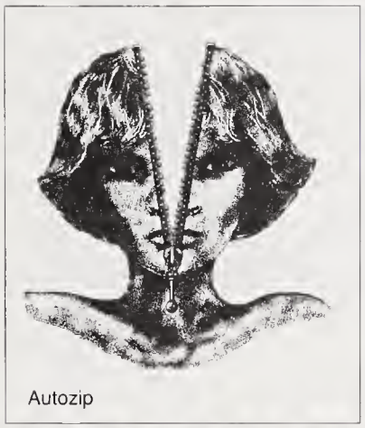
French artist Dominique de Bardonnèche-Berglund is a self-taught painter degreed in history and art history with an emphasis in medieval archeology. She began working with the Macintosh in 1985 and describes herself as "not a born artist," frustrated until she discovered the computer. Little by little, the machine opened a world of new images, introduced a panorama of kaleidoscopic possibilities. She found that besides using the metaphoric artist's tools of the painting programs, she could make copies, enlarge, revise and invert images, save her results at each step in the creative process, erase mistakes without damage, and rework the images to perfection. She feels the limits of the medium -- for example, she can't see the work as a whole while she is creating it. But she also feels like an artist with a new instrument, a new technique to explore, a constant source of amazement. None of her works begin with scanned images; all are completely mouse drawn, using a Mac Plus, MacPaint, FullPaint, or SuperPaint.

AUTOPORTRAITS

Autocrate

Autonomie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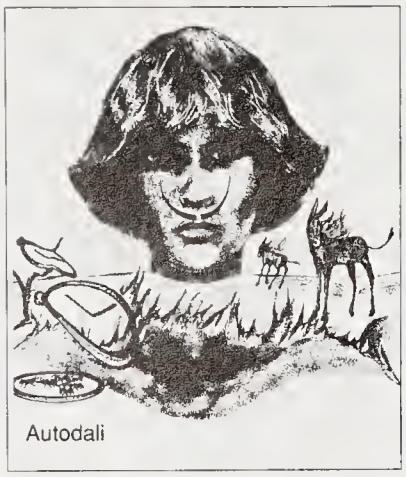
The *Autoportraits* shown here and on the next two pages are part of a series of 50 images.

2



Autodali

Autodafé

3

"S'il y a de la magie dans la technique,
c'est que l'artiste est magicien"

4

5

Autodestruction 1

Autodestruction 2

Autodestruction 3

Autodidacte

6

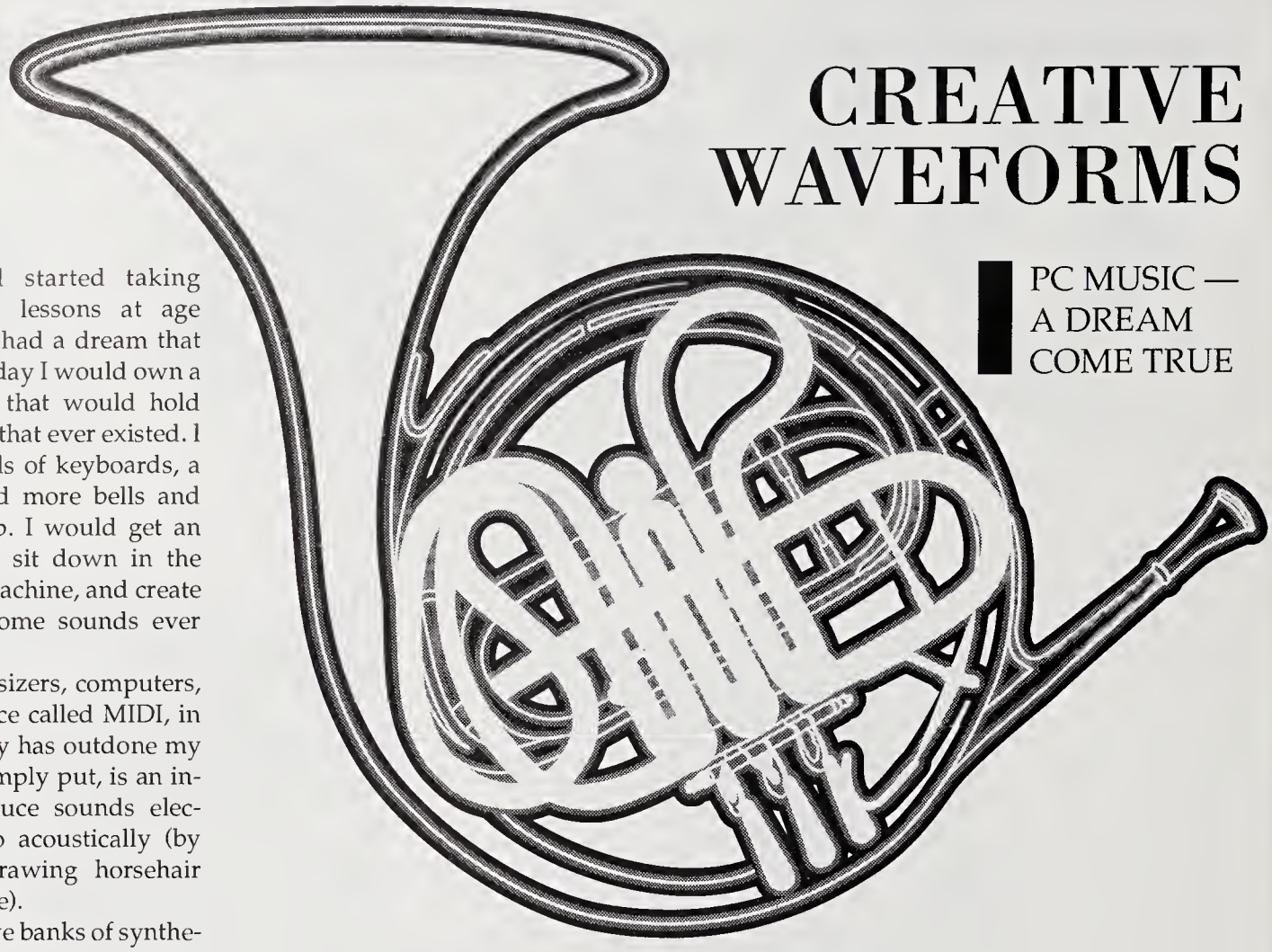
7

1. *l'Arbre*
2. *la Source*
3. *le Don*
4. *Untitled*
5. from *Masques*
6. *Main*
7. *la Révolte de l'Herbier*

■ *Neal Fox*

CREATIVE WAVEFORMS

PC MUSIC — A DREAM COME TRUE



When I started taking music lessons at age ten, I had a dream that someday I would own a room that would hold the biggest theater organ that ever existed. I pictured at least six levels of keyboards, a bank of foot pedals, and more bells and whistles that a spaceship. I would get an unlisted phone number, sit down in the middle of this monster machine, and create some of the most awesome sounds ever imagined, all by myself.

Well, thanks to synthesizers, computers, and an ingenious interface called MIDI, in the last three years reality has outdone my dream. A synthesizer, simply put, is an instrument that can produce sounds electronically as opposed to acoustically (by blowing, striking, or drawing horsehair across catgut, for example).

Synthesists usually have banks of synthesizers around them, each with its own special tricks. The problem until recently has been that you would have needed ten pairs of hands to play all those keyboards simultaneously. So, for the most part, the solution was to put each synth on a separate track of a multitrack tape recorder and mix the sounds together later on. But if you've got twenty-four tracks to work with, and ten of them are taken up by the rhythm section alone, maybe seven are for vocals, and one for the metronome, it's easy to run out of tracks pretty fast.

Then along comes MIDI. MIDI stands for Musical Instrument Digital Interface. Basically, some clever guys got together and created a standard way for synthesizers to talk to each other using computer code. They put a chip in each synth, connected them all up with cables, and "Voilá!" one synth could control all the others. And since it's all done via computer technology, it was a natural for personal computers to get into the act.

Here are just a few things you can do with some synthesizers and MIDI:

- Play all your synthesizers from one master synth.
- Change the sounds on all or some of the synths from the master synth.
- Add effects gear, such as echo and lighting boxes, and control them from the master synth. (Imagine being able to push one button on your master and have not only the sound but the echo and lighting change as well. Great for live acts!)

One way to show you what MIDI can do is to walk you through a project I'm currently working on with one of my partners, Rick Patterson. We're co-writing the score for a new film called *The Return of the Killer Tomatoes*. It doesn't have a *Star Trek* budget, so almost all of the music will have to be done on synth.

We start with a video tape of the scenes that need music. On one of the two audio tracks we have the dialogue, and on the other is a SMPTE time code track. SMPTE stands for Society of Motion Picture and Television Engineers. The Society's time code is becoming the standard code for synchronizing film, video, and audio. This code is an audio signal that contains a running record of how much time has elapsed. You can also have the timings appear visually on the video screen, showing the hours, minutes, seconds, and frames.

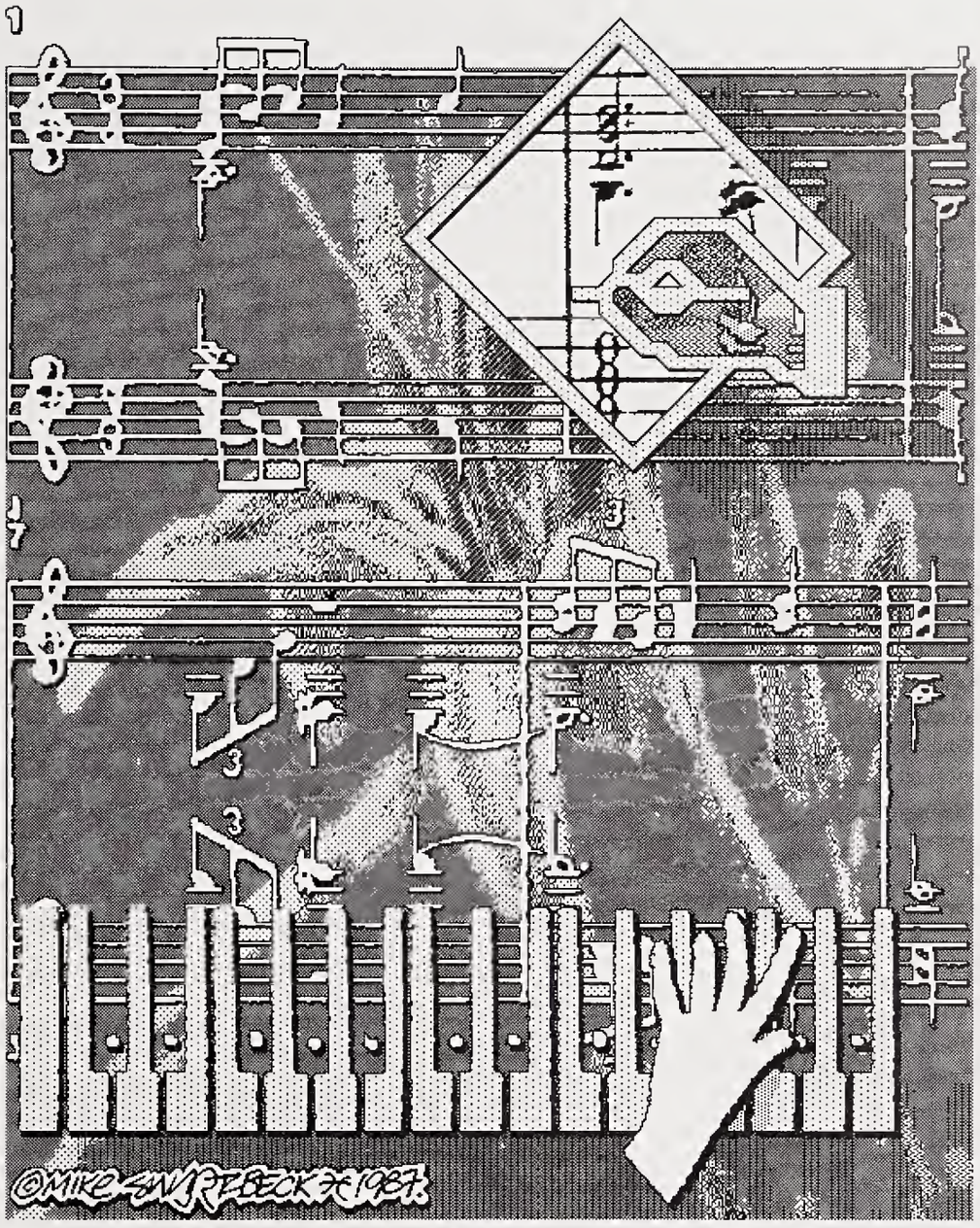
Using the video tape, we then make a "hit list" marking the exact spots a musical "hit" should occur. For example, at one minute, three seconds, and twenty frames the hero gets hit with a pie, and so on.

After all the hits have been listed, it's time to write music that not only fills the emotional requirements, but also matches the hits on the list. In the old days (maybe two whole years ago) this process required some pencils, paper, and a penchant for math. Now all we do is go to our trusty old computer and boot up one of the new film music programs, such as Cue from Opcode, and life is good.

We start by entering a tempo into the computer. Then enter the hits from the hit list. The computer shows how many of the hits fall "on the beat," or some musical subdivision of the beat. If not enough hits fall close enough, we just change the tempo, and the computer happily recalculates for us. Cue will even calculate tempo changes within the piece to force the hits to match better.

Now that we've got our tempo and hits mapped out, Cue can print out custom music paper listing the hits and descriptions above the staff. Then all we have to do is write the music and play it into our sequencer. A sequencer is software that makes a computer work like a tape recorder, except that instead of recording sounds onto tape, it records events such as note on, note off, duration, pitch, and other types of data into computer memory. The

In tune by Mike Swartzbeck, using ThunderScanned images and FullPaint.



computer has no idea what sounds it's making the synthesizer play.

The sequencer I use is Mark of the Unicorn's "Performer." The older version, 1.2, is very reliable, but the new version, 2.0, was shipped without many important features and with some wonderful bugs. Nevertheless, Performer is my sequencer of choice for the Macintosh. And the Mac is my computer of choice for music. The IBM has some very sophisticated music programs, but the amount of software available and the ease of use make the Mac a better buy. (If you're on a tight budget, you can get some excellent software for the Atari ST and Commodore 64.)

Another little box that a MIDI studio must have is a MIDI interface to connect the computer to the synthesizers. My Jam Box 4+ from Southworth connects to the Mac through the modem port and provides for up to four MIDI outs from the Jam Box to four synthesizers via special MIDI cables. But I use only one MIDI out of the Jam Box to go into another box called a MIDI patcher, which acts as a patch bay for routing MIDI signals. Mine has four ins and eight outs. If I ever run out of output (eventually everyone does), I'll buy a bigger patcher or put the three remaining outputs on the Jam Box to use.

Now the Mac can talk to my synths and vice versa. So I play my controller keyboard (the Yamaha DX7) and record the music I've written, into the sequencer. Of course, my chops aren't what they used to be, so when I get to a difficult passage, I slow the sequencer way down to a speed that's easy to deal with. Because the computer doesn't record sound, slowing down and speeding up doesn't change the pitch the way it would with a tape recorder. Once I play it back at the correct speed, I sound just like Oscar Peterson — sorta.

Now we come to quantizing. Otherwise known as autocorrect, quantizing takes the notes I've entered and moves them to the nearest quarter, eighth, sixteenth, or thirty-second note. The result is a track that is rhythmically perfect. Sometimes too perfect. Live people don't play as exactly as machines do. But that's another reason Performer is such a powerful sequencer. You have the option to quantize one or all of the notes, and instead of quantizing exactly on the beat, you can place the notes ahead or behind. Performer divides a quarter note into four hundred and eighty parts, so you have a lot of leeway. You can also specify that only the notes that fall within a particular percentage of the "grid" should be subject to quantizing. And, last but not least, you can specify a percentage for how far you want the notes to move toward the grid.

The editing features the computer brings to music are phenomenal. You can single out one note of a chord and change its pitch, volume, or duration. You can copy a whole passage and paste it into another track, or somewhere later on in the piece. You can make one measure of one track loop itself while the other tracks continue. You can change the volume, tempo, and program. (A program, as the word is used here, is a synth sound. Imagine being able to call up a different sound on each synth for each new section. Sure makes life interesting.)

If you get bored with the sounds your synth came with, you can use an editor/librarian program. These programs make it easy to store thousands of synth sounds on floppies. They can also help when it comes to editing, or creating sounds from scratch. I've got the Opcode Editor/Librarian for my DX7, TX316, and Oberheim Xpander. I usually go through my sounds and create a

new library for each project I'm working on. Then I dump the sounds I need into the appropriate synth.

Finally, we reach a point when all our music has been entered into the sequencer. One track has a chordal part, another track has the bass part, and several other tracks have the drum machine parts. (You mean you didn't buy a drum machine?)

For some finishing touches we might want to program our MIDI-compatible echo box. I've got the Korg DRV-2000. It runs a little more than $500, but there are some great little echo units for as little as $200 to $300 that are fully MIDI-compatible. We want our snare drum track to have a weird echo all its own, so I'll program the echo into the sequence as well.

Now the high-tech fun really begins. Remember that video tape with the Jam Box, which will read SMPTE and generate MIDI clock. Simply put (simply?? after three weeks with my head in the manuals!) we can now roll the video tape and have it run the sequencer in perfect sync. This way we can be sure our music lines up exactly with the picture. Roll back a little and the music follows to the new position.

At this point we have two options. We can either record the music directly to analog tape as our finished product, or we can record the synths onto a multitrack tape recorder. I would go to a multitrack only to get more synths into my arrangement or to add live acoustic instruments or vocals. Usually, I use more than one synth just for the string section, so I can run out of synths pretty fast if I'm writing "thick" music. But if you're writing some new-age music that has a lot of space to it, your best bet is the first one — to record it "live" to tape. That way your final mix is only one generation removed. Better yet, any month now there will be DAT — Digital Audio Tape. Then we can all create CD-quality mixes at home.

Even if I end up going to multitrack, I will have done hours of preproduction in the privacy of my own bedroom. All I'll have to do is to find someone to lug the synths and computer to the local twenty-four track studio and run it off onto tape. The savings will be substantial.

Okay, so maybe we have a little money left in the budget (ha) and we want to hire a live brass section to add to our synth track. I'll just play the parts into the sequencer and have my music printing program print out the music for the musicians to read. Unfortunately, music printing is hard for a computer to understand, even with the expensive programs, so I'll spend a lot of time editing it to make it readable. But if I print it out on a laser printer, the results will, no doubt, impress the brass section so much that they'll stick around to give us samples of their sounds to use in our sampling machine (double ha!)

A sampling machine, or sampler, is another type of synthesizer. It produces sound by taking thousands of "samples" of sound waves and storing them in computer memory. Just like a digitized picture, the more samples, the better the resolution. Samples can come from a microphone, a tape deck, or a record player. Once you have the sample in the machine, you can edit it, loop it, reverse it, and just plain have fun with it.

Hobbyists can get samplers for a couple hundred dollars. Or you can get what Michael Jackson used (Synclavier) on "Thriller" for a mere quarter of a mil. I have the Akai S900. Most pro machines cost $1500 to $3000.

Of course, if you're serious about your sampling, you've got to get Sound Designer, software by Digidesign ($495 list). With it you can do things on your Mac that could previously be done only on the most expensive systems:

- Edit with an accuracy of 1/50,000th of a second.
- Find natural loops (very hard to do without visual representation).
- Draw waveforms or repair flaws with a pencil tool.
- Create new sounds no one has even dreamed of by cross-fading or splicing several samples together. (Try putting a piano attack on a violin).

Most of the gear I've mentioned here is professional and costly, but there are cheaper alternatives. The Casio 101 synthesizer, the lower-end Yamaha synths such as the FB01 and TX81Z, and others fall within the $250 to $500 range, and the sounds are good. You can get drum machines in the same price range. You may not sound like Phil Collins, but the gear will work for you. And nothing can beat the thrill of hearing the computer play your synths for the first time. It's almost spooky!

Now you have a general idea of what can be done today in music with personal computers. For more details check Keyboard Magazine and Electronic Musician.

My "dream come true" still has quite a few bugs in it — my friends can attest to how much hair I used to have before MIDI. But it's already outdone anything I ever dreamed of as a kid.

San Diego musician Neal Fox is a five-time winner in the American Song Festival. He has recorded for Polydor, Columbia Records, and RCA. In addition to providing synthesizer scoring for Attack of the Killer Tomatoes *and* Return of the Killer Tomatoes, *he also wrote the theme song for* A Minor Miracle, *starring John Houston and Pele, and co-wrote the 40-minute score for* Happy Hour, *starring Rich Little and Jamie Farr. He has composed and performed hundreds of jingles for such clients as Domino's Pizza and Ford Motors. Currently he is a partner in the recently formed Patterson & Walz Music Productions (soon to be Patterson, Walz & Fox).*

cricket

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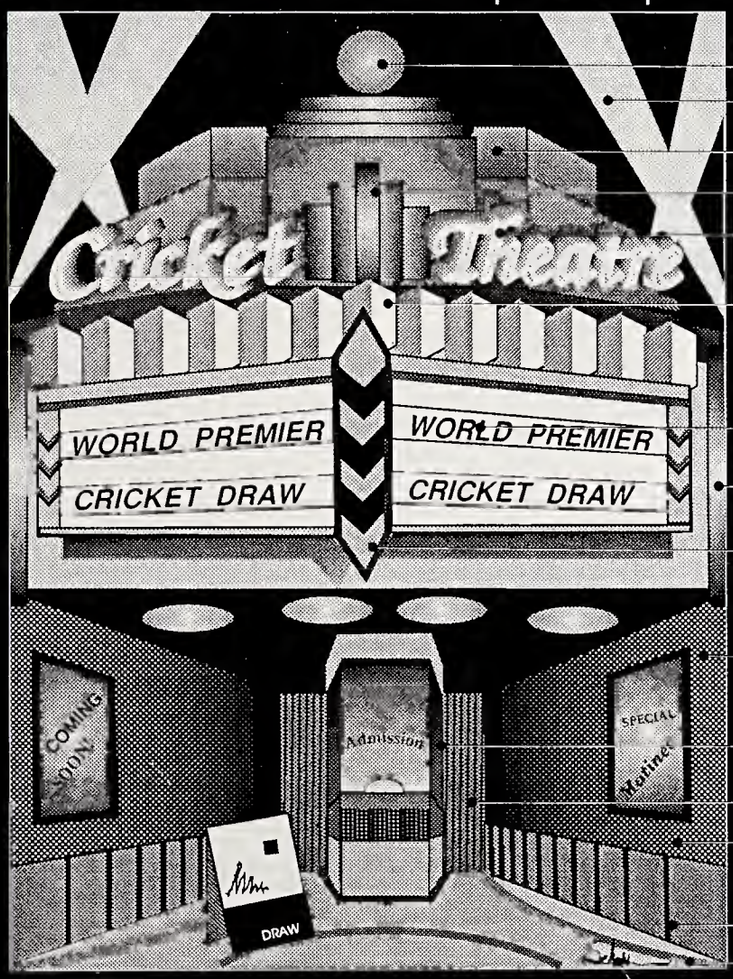

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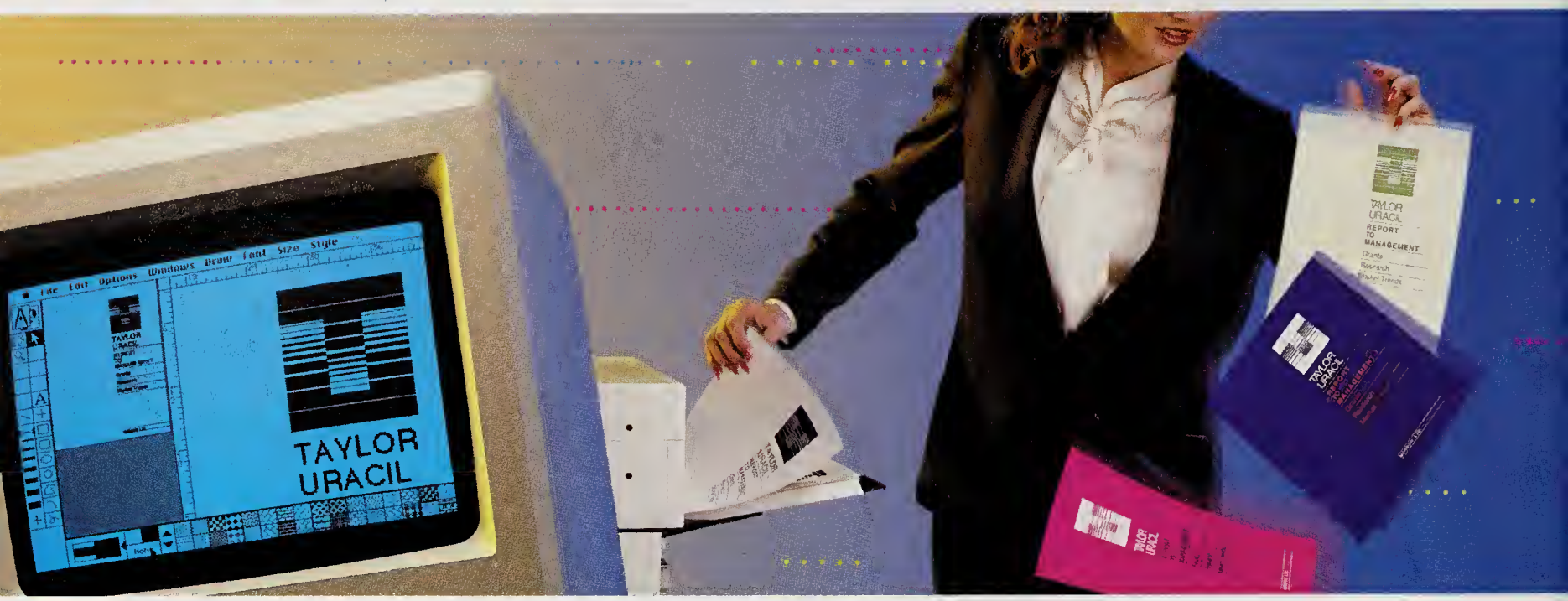

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The KroyKolor processor accepts materials up to 12" wide. KroyKolor transfer films are slightly larger than an 8½-11" page, providing edge-to-edge coverage.

KroyKolor™

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The combination of computer art and screenprinting is a marriage designed to endure. Limited edition, hand-pulled, hand-separated screen prints are an excellent way of marketing your art. Enlarge or reduce, add color to enhance — work directly with the printer to achieve the best results. Chet Wooding, a photographic designer and fine art silkscreen printer has been printing his own work as well as others' for the past thirteen years. Artists include Michael Gosney, Ed Roxburgh, Richard Carter, and David Diaz. Contact Chet Wooding • Graphics, 4593 Massachusetts, San Diego, CA 92116. Housing arrangements can be made for visiting artists.

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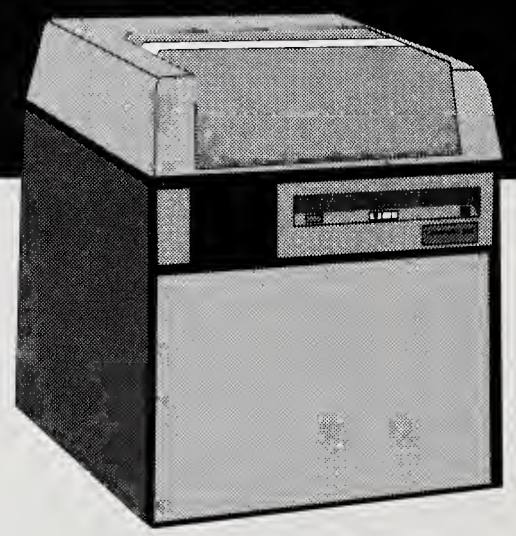

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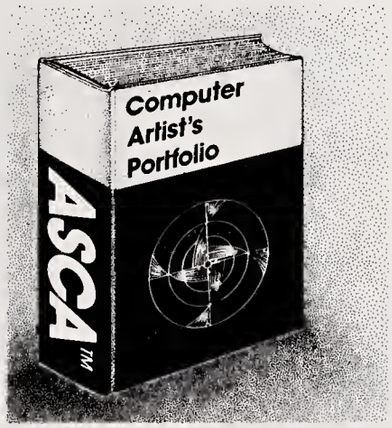

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CLIP ART

ClickArt Windows Scrapbook+ (for the IBM PC or compatibles running Microsoft Windows 2.0)

An intelligent art manager program that gives the user immediate access to stored graphic images. Scrapbook+ will store any type of data and can display text, bit maps, MetaFiles, encapsulated PostScript (EPSF), and Owner-Display objects. The application can be used for graphic image storage, organization, viewing, and retrieval. Available early December. Introductory price is $129.95. T/Maker Company, 1973 Landings Drive, Mountain View, CA 94043. (415) 962-0195.

ClickArt Image Portfolios (for the Macintosh)

Four separate design portfolios that provide thousands of professionally drawn images. Business Image is a portfolio of industrial symbols, borders, flowchart templates, and graphic alphabets. Personal Graphics includes contemporary images of people, animals, cars, symbols, arrows, borders, and stars, as well as Michelangelo's David, Rodin's Thinker, and famous personalities such as Einstein. Publications includes borders, dingbats, cartoons, maps, and decorative alphabets designed for use in newsletters. In addition it contains two- and-three-column layout guides and numerous headlines (such as "Letters to the Editor," "Notice," "We're Moving") sized to match the layouts. Holidays offers numerous images for holidays such as Christmas, Hannukah, Thanksgiving, Easter, Halloween, Graduation, Fourth of July, and Father's Day. Suggested retail price is $49.95 each. T/Maker Company, 1973 Landings Drive, Mountain View, CA 94043. (415) 962-0195.

Digit-Art Laser Graphics (for the Macintosh)

Two new volumes of clip art for the Macintosh, now available in both MacPaint and MacDraw formats. Volume 1 features 19 cut -and-paste fonts, over 200 pictures and graphics, borders, symbols, headlines, and a user's guide. Volume 2 includes more clip art pictures, symbols, and graphics, as well as stencil pages for flyers, diploma and invitation borders, logo makers, cartoons, people, and a user's guide. Suggested retail price for either three-disk set is $99. Image Club Graphics, 2828 19th St., N.E., Calgary, Alberta, Canada T2E 6Y9. (403) 250-1969.

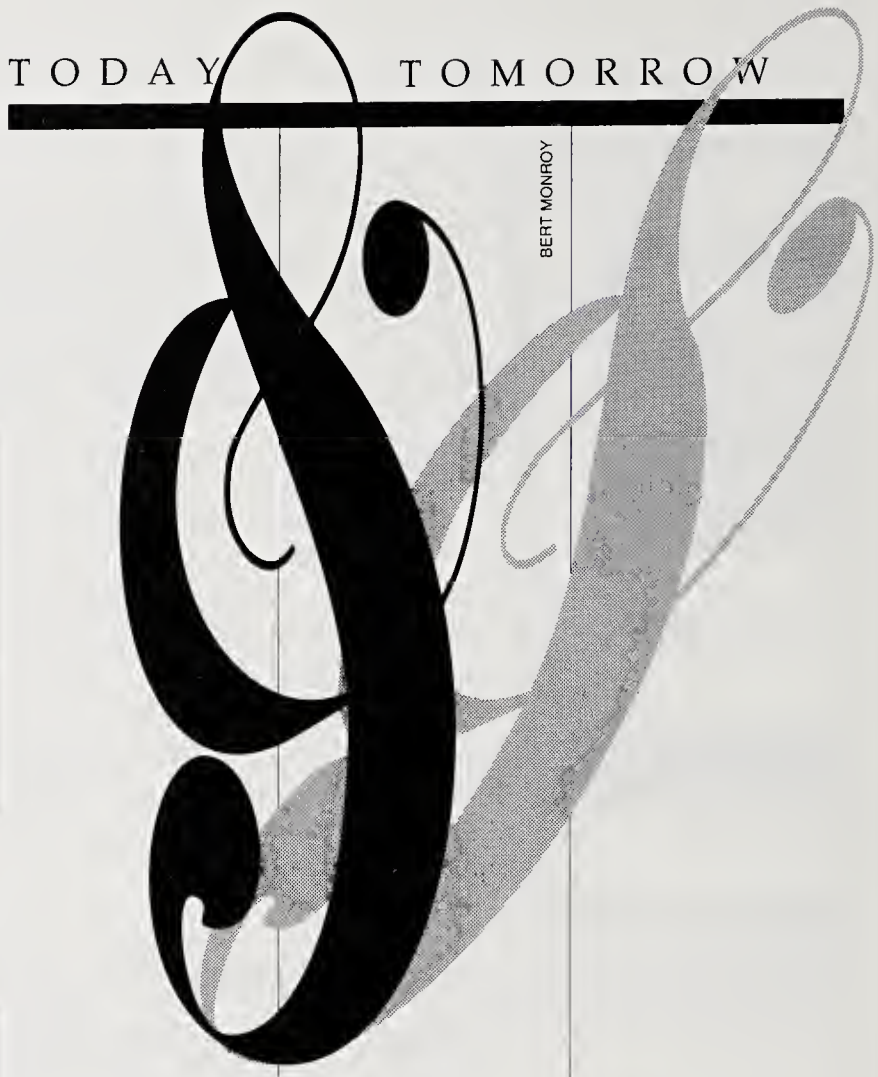
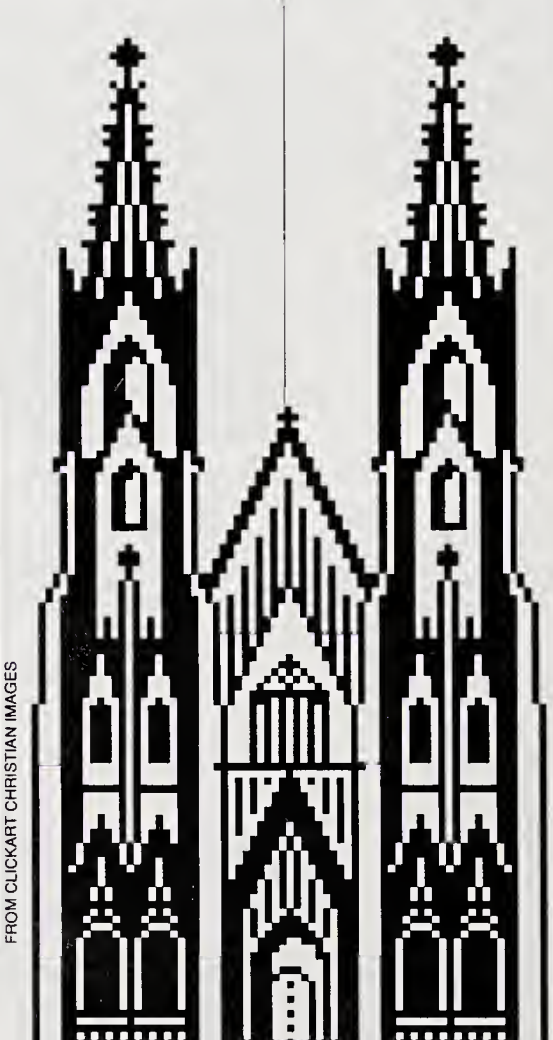
Publisher's PicturePaks (for programs that read PC Paintbrush, .PCC and .PCX file formats)

Designed for business use — no teddy bears or unicorns. The clip art is organized by subject matter, and the Eye Openers Series includes three editions containing pictures useful to all business professionals. The first three titles are: Executive and Management Edition, Finance and Administration Edition, and Sales and Marketing Edition. Suggested retail price for each pack is $195. Marketing Graphics Inc., 401 East Main Street, Richmond, VA 23219. (804) 788-8844.

Windows Portfolio and Holiday ClipArt (for use with all Windows-compatible applications)

A Windows-compatible program enabling users to select and copy clip-art images to the Windows Clipboard. This provides a convenient and inexpensive way for Windows users to obtain access to Micrografx' ClipArt libraries. Holiday ClipArt, a library of several hundred color, object-based images compatible with PostScript, PageMaker, AutoCAD (requires Windows Convert) and all Windows-compatible applications, providing artwork for each major holiday. Micrografx offers other ClipArt libraries: General, Maps, Computers and Office, Signs, Flags, Space and Astrology, MechanicaI, Electrical, Architectural, and Chemical. Four additional libraries, including Headline (Vol. 1), Military, Vehicles, and People, Places and Things will be available in December 1987. Suggested retail price for Windows Portfolio including the index, the General Library, and a coupon good for one free ClipArt library is $99.95. Suggested retaiI price for Holiday ClipArt and the other libraries is $49.95 each. Micrografx, Inc., 1820 N. Greenville Ave., Richardson, Texas 75081. (214) 234-1769.

MacAtlas Pro Version (for the Macintosh)

Maps designed by a professional cartographer; accurate, attractive, and compatible with MacDraw, CricketDraw, PageMaker, RSG!, Colormate, and any other compatible program accepting PICT format graphics. The two-disk set contains over 60 individual maps, including the continents by country, the United States by state, and all 50 states by county. Suggested retail price is $199. MicroMaps, P.O. Box 757, Lambertville, NJ 08530. (609) 397-1611.



FROM CLICKART CHRISTIAN IMAGES

ClickArt Christian Images (for the Macintosh and IBM PC and compatibles)

A collection of Christian art with over 600 professionally drawn religious images designed to appeal to the wide range of Christian denominations.Suggested retail price is $59.95. T/Maker Company, 1973 Landings Drive, Mountain View, CA 94043. (415) 962-0195.

ClickArt EPS Images (for the Macintosh and IBM PC and compatibles)

A portfolio of over 125 EPSF art files specially designed for use with advanced desktop publishing applications. Compatible with Aldus's PageMaker 2.0, PC PageMaker 2.0, Xerox's Ventura 1.1, Letraset's ReadySetGo! 4.0, Quark XPRESS, Adobe Illustrator, and CricketDraw, or any other application supporting EPS.Suggested retail price is $129.95. T/Maker Company, 1973 Landings Drive, Mountain View, CA 94043. (415) 962-0195.

Post-Art (for the Macintosh)

Unlike traditional clip art, which usually consists of small pictures and symbols, Post-Art is a three-disk set including over 800k of full-size illustrations by award-winning artist J. Ciccone. To take full advantage of the resolution of PostScript printers like the LaserWriter, Post-Art illustrations were created using MacDraw, Cricket Draw, and Adobe Illustrator. PostScript files of all illustrations are also included, together with SendPS, a utility that lets the user print every file without the need of a drawing program. Suggested retail price is $49.95. Olduvai Software, Inc., 6900 Mentone, Coral Gables, FL 33146. (305) 665-4665.

Gutenberg Set (for the Macintosh)

Scenes from turn-of-the-century nostalgic clip art, sized for page-layout programs. Illuminated Letters provides humorous and eyecatching old letters from the illuminated text of Punch of the 1800's;

Head & Tail Pieces offers a full range of topical headers, indexes, contents, and so forth; Characters & Expressions includes characters exhibiting every imaginable expression or gesture; Business Illustrations depicts the office and business machines from yesteryear; and the final release in this series, Symbols, Signs & Fancy Letters, provides useful symbols, old advertising signs, and letters in Art Nouveau and many other styles. Suggested retail price for the five-disk set is $130. ImageWorld, Inc., P.O. Box 10415, Eugene, OR 97440. (503) 485-0395.

LARGE-SCREEN MONITORS

Moniterm Viking 1 (for the Mac SE, Mac II, IBM PC/XT/AT, and PC/2 family or compatibles)

Allows desktop publishers to see two full pages with ultra-high-resolution of 1280 x 960 pixels. Type as small as six points is crisp and solid on a 19-inch screen. Other features include noninterlaced scanning and a 66 Hz refresh to eliminate annoying flicker; offers two separate screen modes of operation, Extend Mode and Magnify Mode. In the Extend mode, the Mac SE becomes a vertically scrollable extension of the large screen; and in the Magnify mode, the SE displays two levels of FatBits-style magnification of whatever the cursor is pointing to. Suggested retail price $1995. Moniterm Corporation, 5740 Green Circle Drive, Minnetonka, MN 55343. (612) 935-4151.

SCANNING, VIDEO DIGITIZERS, AND DIGITIZING SOFTWARE

Microtek MSF-300G (for the Macintosh, IBM & PC compatibles)

A new high-resolution desktop image scanner capable of reproducing 256 shades of gray. With 6 to 8 bits of information available per pixel, graphics editing software allows for gray editing, creating mezzotints, etchings, and posterizations; modification of brightness and image contrast; and rotation or sizing of an image while maintaining the integrity of the original image. The MSF-300G is compatible with third-party software with tools such as charcoal, water drop, and finger paints. The unit will also operate as a single-bit-per-pixel scanner much like the current MS-300A but with many new features. The flatbed design allows capture of images from books or other bound documents. Release date and suggested retail price not set at press time, but will be under $4,000. MICROTEK, 16901 S. Western Ave., Gardena, CA 90247. (213) 321-2121.

ImageStudio (for the Macintosh)

Designed to transform the Macintosh into a state-of-the-art retouching studio. This application allows extensive manipulation of image gray-level information generated by high-resolution scanners and supports 64 levels of gray, has a gray-map editor for changing brightness and contrast, and can create a variety of effects such as posterization, solarization, and negatives. Zoom capabilities allow reduction and enlargement from 25 to 1600 percent; multiple views of the same image allows simultaneous viewing of changes at more than one magnification, and direct import of tagged-image file format (TIFF), raster-image file format (RIFF), ThunderScan, MacPaint, and FOTO file formats allows this software to be used with most of the popular desktop scanners. In addition to the gray-map editor, ImageStudio comes with a full complement of design tools, including a paintbrush, water drop, charcoal, and finger, that work the way traditional artists' tools work. These tools allow a variety of effects including air brushing, edge-softening and paint-smearing. Suggested retail price is $495. Letraset, 40 Eisenhower Drive, Paramus, NJ 07653. (201) 845-6100.

ThunderScan (version 4.0) (for the Macintosh)

Returns true gray-scale information at up to 288 dpi to the Macintosh, not just dithered bitmaps. Users can alter contrast and brightness after the scan, eliminating the need to rescan for different effects. Gray-scale information specifies dot grayness produced by a PostScript printer, giving true halftone representation on scanned images. ThunderScan saves files in EPSF, and TIFF. Suggested retail price is $249. Thunderware, Inc., 21 Orinda Way, Orinda, CA 94563. (415) 254-6581.

The Imagizer System (for the Macintosh)

Creates ready-for-print, halftone graphics from photos or three-dimensional objects. The Macnivision Camera captures both objects and photos in 750-line resolution – three times the 250-line clarity of consumer hand-held video cameras and even 50 percent better than broadcast standards. The user can see and adjust an image on the system's 5-inch monitor before the image is captured. The Imagizer and Imagizer software provides all on-screen editing using from 2 to 256 shades of gray for true print-quality halftones. Also fine tuning of brightness and contrast can be accomplished after an image is taken. TIFF is supported to allow interaction with PageMaker 2.0 , and you can crop and resize any scanned image on the PageMaker page (this exclusive image-size control and PageMaker compatibility was co-developed by Aldus and Comtrex). Scanned images can also be stored in PostScript. With the Imagizer 4 Color Process Accessories, a user can make four-color process separations on a LaserWriter. Suggested retail price of the Imagizer Complete System including Genlock Macnivision Camera with color-corrected lens and copy stand, color-corrected fluorescent lights, desktop tripod, connecting cables, 5-inch color TV/monitor, Imagizer digitizer and software, four-color process filters, filter mount, and PostScript process color instructions is $2995. Comtrex Limited, P.O. Box 1450, El Toro, CA 92630. (714) 855-6600.

ProViz Video Digitizing System (for any Mac with a SCSI interface and at least 1 MB of RAM)

Can digitize images from flat copy as well as from any standard video source: camera, videotape, television, or.the video output of other computers. ProViz delivers a crisp, clear picture from a single video frame, comparable to an image produced by an 8-bit digitizer. Files can be saved in EPSF, TIFF, or PICT format, and are compatible with all leading page-composition software, where they can be scaled, stretched, and cropped. ProViz allows the user not only to edit files but also to output to videotape. Suggested retail price is $1595. PixelLogic, Inc, 38 Montvale Ave., Stoneham, MA 02180. (617) 438-5520.

DigiView Color Video Digitizing System (for the Amiga)

Digitizes images in any number of colors up to 4096. Dithering routines give up to 100,000 apparent colors on screen. Digi-View digitizes in all Amiga resolution modes from 320 x 320 to 640 x 400. It prints, animates, transmits, stores, and manipulates images with available IFF-compatible programs. Suggested retail price is $195. NewTek, Inc. Call 1-800-843-8934 for dealer nearest you.

SPECIALITY PROGRAMS

Icon-It! (for the Mac 512K to Mac II)

A user interface enhancer that lets you assign familiar pictures to represent the menu items you use most (including desk accessories), so you can choose them without pulling down menus or remembering command key combinations. Templates for the most popular programs are included, or you can make your own icons and icon bars with the built-in editor. Suggested retail price is $59.95. Olduvai Software, Inc., 6900 Mentone, Coral Gables, FL 33146. (305) 665-4665.

DA Switcher (for the Macintosh)

Does away with the limit on the number of desk accessories. DA's most frequently used with any application can be grouped in a "set". Each "set" can have up to 14 different DA's, and there is no limit to the number of sets you can use. Suggested retail price is $39.95. Olduvai Software, Inc., 6900 Mentone, Coral Gables, FL 33146. (305) 665-4665.

DRAWING PROGRAMS

Canvas (for the Macintosh)

(See "The Artist's Toolbox" in this issue for review.) Operates as an application or a DA. Canvas integrates all the features of MacPaint and MacDraw, but adds the ability to view and edit drawings at magnification or reduction levels from 3.125 to 3200 percent. Users have a continuous drawing size of up to 9 x 9 feet. With the Canvas DA, users can edit or create illustrations without ever leaving their word processor or desktop publishing application. Suggested retail price for Canvas (including desk accessory) is $195. The Canvas DA alone is $99.95. Deneba Software, 7855 N.W. 12th Street, Suite 202, Miami, FL 33126. (315) 594-6965.

The Curator (for the Macintosh)

A tool for cataloguing, accessing, and integrating artwork. The Curator exists as both an application and a desk accessory. Without cutting and pasting into a Scrapbook., users can choose to look for artwork created in any of the following formats: MacPaint, PICT, TIFF, EPSF, or Glue. The Curator gives the user a pictorial table of contents made up of miniature representations of all artwork in any folder. For example, while working in PageMaker, a user can tell The Curator to show all artwork created as PICT (or any of the other formats mentioned above) in a certain folder. Miniatures of those graphics will appear in the table of contents. If the item sought is not there, the user can search through another folder or even a different disk. Double-clicking on the graphic opens the file. Suggested retail price is $139.95. Solutions International, Box 989, 29 Main Street, Montpelier, Vermont 05602. (802) 229-9146.

ANIMATION & VIDEO

VideoWorks II (for the Macintosh and Mac II)

Brings real-time animation to the Macintosh. With the Mac II the user can have up to 256 colors. VideoWorks II is designed to allow even beginners to create professional-looking animated desktop presentations, including sound, in a matter of minutes by using previously created original artwork, or by using a wide selection of clip art. VideoWorks II includes three 800K disks with an animated guided tour; Overview, a selection of clip animation; and Art Grabber+, a utility that allows the user to "grab" art from any MacPaint document without exiting VideoWorks. Using the Launch Editor command, users can launch directly from Overview into other applications such as MacPaint or MacDraw without leaving Overview. Suggested retail price is $195. MacroMind Inc., 1028 W. Wolfram St, Chicago, IL 60657. (312) 871-0987.

The Comic Strip Factory (version 1.6), "HyperComics" (for the Macintosh)

Allows users to create panel layouts that exactly match HyperCard card size. HyperCard comics can be up to four panels wide or deep. Once created, "HyperComics" are saved as MacPaint-compatible files and

imported into HyperCard using Import Paint. After a stack of similar "HyperComics" is created, the user can create "animated" HyperCard comics and other effects. Requires a minimum of 512K. Suggested retail price is $89.95. Foundation Publishing, 10301 Yellow Circle Drive, Minneapolis MN 55343. (612) 935-4230.

DeskPaint (for the Macintosh)

Provides many more features than MacPaint in a DA occupying only 25K. This DA can zoom images from .25x to 16x, and rotate left, right, or free rotate. DeskPaint allows users to browse through Paint or Scrapbook files one step at a time or to select Auto, allowing DeskPaint to do the work automatically. DeskPaint accepts TIFF files, and offers advanced screening and the setting of gray-scale levels. It is compatible with most Macintosh programs that support DA's and the clipboard. Suggested retail price is $59.95; after March '88, $99.95. Zedcor, 4500 E. Speedway, Suite 22, Tuscon, AZ 85712-5305. 1-800-482-4567.

Super 3D (for the Macintosh) and **Super 3D Enhanced** (for the Mac II)

Allows users to create sophisticated animation for dynamic visualization of complex structures. Super 3D provides an intuitive user interface, using movie camera–like tools for precise visual control. The program can provide artists, architects, engineers, and designers with many of the dynamic simulation and modeling capabilities previously available only on dedicated 3-D graphics hardware. A Camera Control Window lets users "dolly" an imaginary camera in, out, left, right, up, and down or zoom in. Super 3D Enhanced for Mac II will offer a tremendous speed increase in rendering the 3-D images on screen. Using the Extended Video Card on the Mac II, Super 3D Enhanced will color objects with 256 colors at once from a palette of 16.7 million. A proprietary dithering algorithm will allow 16,384 colors simultaneously for achieving subtle shading effects. Suggested retail price is $295 for the standard Super 3D and $495 for Super 3D Enhanced. Silicon Beach Software, P.O. Box 261430. San Diego, CA 92126. (619) 695-6956.

PixelPaint (for the Mac II)

Designed specifically for the Macintosh II to create or enhance color and gray-scale images. Images can be created from scratch or imported from other applications for "colorizing." In addition to providing full clipboard support, Pixel Paint can directly read MacPaint, PICT 1, PICT 2, or EPSF. Innovative shortcuts, unique pop-up menus, and color wheel are some of the features of this new color graphics program. A spectrum of 16.8 million colors is accessible by defining color palettes of up to 256 colors at a time. Pixel Paint describes each screen pixel as a PostScript object, taking into account color and gray-scale values, and images can be printed to the full resolution of any PostScript output device. Color imaging devices such as film recorders are also supported. Recommended hardware is Mac II, 2 MB RAM, hard disk, and color or large screen monitor. Available late fall 1987, with a suggested list price between $300 and $500. SuperMac Software, 295 N. Bernardo Avenue, Mountain View, CA 94043. (415) 964-9694.

PosterMaker Plus (for the Macintosh)

Solves the "jaggies" problem of the original PosterMaker. PosterMaker Plus gives the illustrator the tools to create professional posters, banners, and signs, and gives the desktop publisher a means to manipulate headlines. SmoothFonts stay smooth at any size and can be stretched, rotated, arched, and flipped and still stay smooth. Scaling from 1 to 3200 percent it's compatible with any Apple printer, including the 15-inch Imagewriter at 72 dpi, the LaserWriter at 300 dpi, and with SuperPaint, MacPaint, MacDraw, and any other software that saves as PICT. The package includes two 800K disks, users manual, SmoothFonts, and ready-made poster templates. Suggested retail price is $59.95. Strider Software, Beecher Lake Road, Pembine, WI 54156. (715) 324-5487.

Designer (for Microsoft Windows)

A full-color graphic art and technical illustration program compatible with any computer running Microsoft Windows. Designer offers scanned image support, and bit-mapped images from scanners or paint programs can be imported, merged, and saved. Images can be traced, stretched, and cropped, and color is easily added. Other features include polygon and curve editing, polygonal pathing for creating and filling irregularly shaped objects, smoothing and unsmoothing, rotation of text and graphics in user-defined increments of one-tenth of a degree, user-definable overlays with up to 64 layers. Colors may be restricted by layer for color separations. Designer's user interface is based on Windows 2.0 and is identical to the user interface of IBM's Presentation Manager for OS/2. Suggested retail price is $695. Micrografx, Inc., 1820 N. Greenville Ave., Richardson, Texas 75081. (214) 234-1769.

DESKTOP PUBLISHING

The Office Publisher (for IBM PC and compatibles)

Compatible with Word Perfect, MS Word, Wordstar, and Multimate, as well as other word processors through DCA or ASCII format files. Page format can be up to 27 by 27 inches. Text wraps around regular or irregular graphics; text flows from column to column and page to page; kerning of letter pairs can be done manually or automatically; a text block can be converted to all upper case, all lower case, or initial caps; portrait and landscape page layouts can be mixed in the same document; single pages or batches can be reformatted; table of contents and index can be generated for up to 10 Chapter or Section levels. The program allows viewing of facing pages or any two noncontiguous pages, allows WYSIWYG editing, includes an 80,000 word Merriam-Webster dictionary, and provides compatibility with most desktop scanners and laser printers. Suggested retail price is $995. Laser Friendly Inc., 930 Benicia Avenue, Sunnyvale, CA 94086. (408) 730-1921.

Cricket Presents (for the Macintosh)

Will let users create everything needed for presentations. The complete package will combine a color draw application similar to MacDraw, a word processor similar to MacWrite, and a simplified version of Cricket's graphing program, to provide a complete package for professionals to prepare any type of presentation. Users create slides, drag slides to any screen position, type in notes, create handout material, and finally display completed slide presentations on screen. Available Nov 1. Suggested retail price is $495. Cricket Software, 30 Valley Stream Parkway, Great Valley Corp. Center, Malvern, Pa. 19355. (215) 251-9890.

Ready Set Go! 4.0 (for the Macintosh)

Offers full support for EPSF and can reproduce high-resolution graphics from scanners that support gray-scale TIFF. The tool boxes have been integrated into a new tool bar that keeps them accessible to each document a user is working on. New tools include a grabber hand for easier scrolling and a diagonal drawing tool. Automatic run-arounds allow the user to insert objects of any size into the text and set the desired space between the text and graphics, or RSG! 4.0 will automatically run text around the graphic image. Facing pages allow users to interactively view, edit, and lay out two-page spreads. Users also have a choice between manual and automatic kerning and word spacing, as well as the ability to preset hyphenation specifications. Other features included a 100,000-word spell checker that suggests correct spelling alternatives. Text can be linked page to page; and if the user alters the document by adding or deleting text or graphics, the program automatically reflows text throughout the document. Glossaries allow storage of "boilerplate" text that can be recalled with a single keystroke. In addition to the built-in word processor, RSG! 4.0 allows documents to be imported from Microsoft Word, WriteNow, MacWrite, or any files stored as ASCII. Suggested retail price is $495. Letraset USA, 40 Eisenhower Drive, Paramus, NJ 07653. (201) 845-6100.

Shakespeare: The Page Integrator (for the Amiga)

The first color desktop publishing program designed for the Amiga. The user can work with Deluxe Paint and any set of colors, print all graphics in their correct colors, crop text or graphics in any shape, and flow text around graphics or superimpose either. The two disks provide a full set of graphic design templates for instant, easy-to-use page layouts, plus a library of digitized clip art images. It works in the Amiga's multi-tasking environment, and is compatible with the Amiga 500, 1000, and 2000 with a minimum of 512K RAM. The program has built-in support for the Apple LaserWriter and other Postscript printers. Suggested retail price is $225. Infinity, 1144 65th Street, Suite C, Emeryville, CA 94608. (415) 420-1551.

Professional Page (for the Amiga)

Will offer precision typesetting and the ability to store information necessary for full four-color separation. Other features include WYSIWYG word processing, text runarounds, and page templates. Pages can be manipulated and combined with other pages before printing; pages can also be moved, reflected, and rotated to any angle. Page sizes can be up to 17 x 17 inches. A document can be as large as 999 pages (memory dependent); text and graphic boxes can be resized or repositioned and even grouped for simultaneous manipulation. Suggested retail price is $395. Gold Disk, P.O. Box 789, Streetsville Mississauga, Ontario, Canada, L5M 2C2. (416) 828-0913.

TeXtures (for the Macintosh)

Combines the well-known TeX typesetting standard with the ease of use associated with the Mac. This new release will enable business and scientific users to compose and typeset documents of any length and format complexity, including books, technical manuals, scientific papers, and journal articles. It is particularly effective for setting mathematical formulae and scientific notation. TeXtures provides a macro programming language for typesetting that can handle complex table construction, precision-ruled forms and multi-column layouts. The program also automatically performs hyphenation, justification, pagination, kerning, and incorporates features such as global commands.

The package consists of six floppy disks, a user's guide with tutorial, and *The TeX Book*, a reference manual to TeX. Suggested retail price is $495. Addison-Wesley, EMSD, Jacob Way, Reading, MA 01867. (617) 944-3700.

BOOKS AND PUBLICATIONS

Desktop Publishing With PageMaker (for the IBM PC AT, PS/2 and compatibles)

Written by Tony Bove and Cheryl Rhodes. This book covers both the basics and advanced techniques of PageMaker, as well as basic design principles. The book includes a summary of the basics of desktop publishing; a step-by-step approach to layouts for office documents, newsletters, and magazines; a chapter devoted to tips and techniques; and an appendix covering how to convert files from IBM to Macintosh format and back. Suggested retail price is $19.95 (paper). John Wiley & Sons, Inc., 605 Third Avenue, New York, N.Y. 10158. (212) 850-6000.

Desktop Publishers Journal (for all DTP systems)

A quarterly journal designed to serve as a forum for the examination of information, ideas, and issues important to desktop publishing professionals. National Association of Desktop Publishers (NADTP) is an association of communications professionals using computer-based publishing, and dedicated to fostering growth in the desktop publishing industry. NADTP membership ($95.00 annual) includes the Journal, subscription to the *NADTP Buyers Guide/Source Book*, The NADTP Electronic RoundTable on the GEnie network, and discounts for desktop publishing books, publications, trade shows and seminars. A $39.00 membership fee will provide four issues *Desktop Publishers Journal*, but if ordered before Dec. 31, 1987 the premier issue (180 page Vol. 1, No. 1) will be included free. National Association of Desktop Publishers, P.O. Box 508, Kenmore Station, Boston, MA. 02215-9998. (617) 437-6472.

MacDaydreams and **Digital Daydreams** (for all)

Computer-generated artwork from Macs, IBM, Amiga, and Apple II. Along with innovative graphics, both calendars showcase various artists, computer trivia, and step-saving hints. Suggested retail price for each is $10.95. Publishing Ink, contact Roxanne Becker, (800) 54-DREAM; (818) 500-7857 in Alaska, California, and Hawaii.

NEW LASER PRINTERS & ACCESSORIES

ScripTen (for the Macintosh, IBM PC, and compatibles)

Provides ten-page-per-minute, 300 dpi printing in a wide range of type sizes and styles and comes with 11 type families (35 ROM-resident typefaces) in both serif and sans serif styles. ScripTen is available in 2MB and 3MB configurations. Suggested retail price is $4795, 2MB; and $5295, 3MB. Qume Corp., 2350 Qume Drive, San Jose, CA 95131. (800) 223-2479.

LaserWriter Accelerator and Memory Expansion Board (for the Apple LaserWriter and LaserWriter Plus)

Features a 68020 and an extra 2MB of user RAM to handle complex print jobs and multiple downloadable fonts. Increases the page/min. performance of the LaserWriter by more than 100 percent for simple text, and up to 500 percent for complex documents that contain bit maps. Includes a bus connector for future expansion devices such as math co-processors and font servers. Installation involves a simple clip-on connector, and can be performed by any Apple level 1 certified technician. Suggested retail price is $1995 including installation and a full 1 year warranty. Availability is scheduled for the fourth quarter, 1987. Blue Whale Technologies, a division of Olduvai Software, Inc., 6900 Mentone, Coral Gables, FL 33146. (305) 665-4665.

Personal LaserPrinter (for the Macintosh)

Prints scanned images, high-resolution graphics, and text at 300 dpi. Uses QuickDraw and extension (picture comments) for the page description software. For text, the PLP uses high-quality outline fonts developed by Bitstream, Inc., which allow scaling and rotation of any character to any size (2.25 to 512 points) or angle at full 300 dpi resolution. The printer comes complete with all of the fonts available on the Apple LaserWriter, plus versions of Palatino and Helvetica Narrow. A font accessory package is available that provides all the additional fonts of Apple's LaserWriter Plus. Suggested retail price is $2600. General Computer, 215 First St., Cambridge, Massachusetts 02142. (617) 492-5500.

SPECIALITY PRODUCTS

Aesthetics Technology (for all computers)

Paints your computer, or any accesory item, in any color using a polyurethane (a catalyst paint) that will bond to the plastic case in a color of your choice, such as granite, marble, sky blue, lavender, red, or even red-marble. The polyurethane is a heat-resistant coating that will not chip or peel and should last the lifetime of your computer. If you want black, the price is $195, other single colors are $295, Granite is $350, and marble or woodgrain is $895. Aesthetics Technology, 365 Forest, Suite 4E, Palo Alto, CA. 94301. (415) 326-3936.

LASERWRITER TYPE FONTS

Altsys' Fontographer Fonts (for the Macintosh)

Eleven new Fontographer Fonts for use with the Apple LaserWriter: GoudyNewStyle, GoudyOldStyle, Cooper, CooperExtra, CooperOldStyle, Venezia, VeneziaExtra, Borders I&II, Borders III&IV, BlackSanSerif & BlankSanSerif, and PenStroke. Suggested retail price is $59.95 each. Altsys Corporation, 720 Ave. F, Suite 108, Plano, TX 75074. (214) 424-4888.

SPELLING CHECKERS

Spelling Coach, Coach Thesaurus, and **Coach Professional** (for the Macintosh)

Provide spelling and reference information. Spelling Coach is a DA that includes interactive spelling and grammar checking; a batch checking mode that scans documents at over 150 words per second; Merriam-Webster's new 91,000 word dictionary and 28,000 word Legal and 35,000 word Medical libraries; built-in interactive and batch hyphenation; the ability to add any word to the dictionary including technical symbols and foreign language characters; direct support for the thesaurus; and compatibility with over 95 percent of all Mac software.

Coach Merriam-Webster Thesaurus gives access to a 45,000 entry point thesaurus from your favorite word processor.

Coach Professional is the first hypertext spelling and reference system. It provides a concise 80,000 word dictionary with complete definitions. It includes all the features found in Spelling Coach and Coach Thesaurus. Suggested retail price for Spelling Coach 3.0 is $99.95; Coach Merriam-Webster Thesaurus is $59.95; Coach Professional is $195, and a network version of Coach professional that allows up to 31 simultaneous users is $495. Deneba Software, 7855 N.W. 12th Street, Suite 202, Miami, FL 33126. (315) 594-6965.

VERBUM BACK ISSUES—
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1.0
1986 Preview issue
OUT OF PRINT - Taking requests only for possible reprint.
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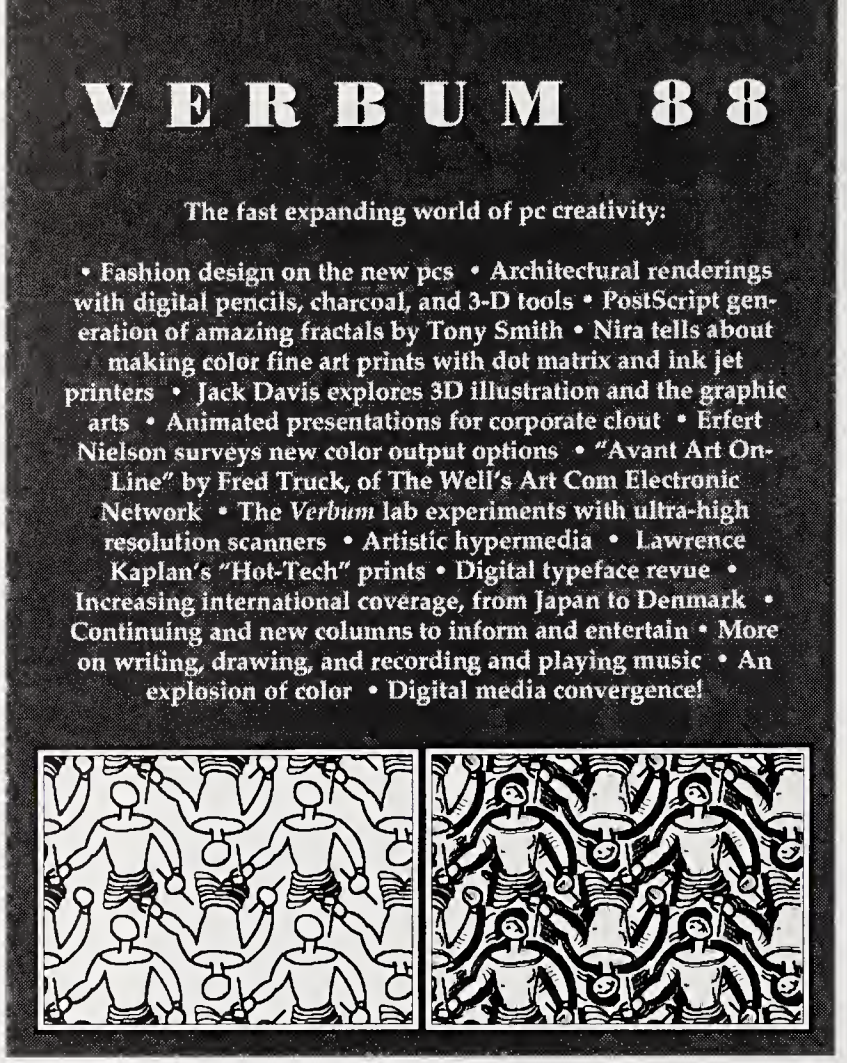
John Odam's original PageMaker 1.0 composition with a retrospective of Michael Gosney's "Macintosh Verbum" one-man show and a fascinating, wide-ranging gallery of the earliest digital art by French illustrator Jean Sole, Michael Green, Australian Malcolm Thain, nature artist Jim Pollock, Jim Hance, Nathan Weedmark, Jack Davis, and Ed Roxburgh.

1.1
Early 1987
The first *Verbum*, all black and white, 300 dpi laser output, beautifully printed on 70 lb. Sequoia Matte. This epic launch of the *Verbum* journal, designed with PageMaker 1.2 by John Odam, inspired designers worldwide. • Featured artists: Avant-garde concept artist Paul Rutkovsky with "redigitized" illustrations, Mike Swartzbeck's trailblazing composite illustrations from scanned images, excerpts from David Brunn's *Irish Book of Invasion* using innovative "digital photography" techniques. • The "Gallery" section explores diverse compositions from a wide range of digital artists. • Columns: Michael Singleton's "The Artist's Toolbox" offers a primer on bit-mapped graphics with a feature-by-feature comparision of leading programs. "Behind the Scenes" by Kim Criswell responds to the state-of-the-industry circa January 1987 with "Big World, MacWorld." "Painting by Numbers" by Tony Smith introduces the PostScript page description language. John Odam's "First Contact" takes Fontographer through its paces in creating logos and an original typeface.

1.2
Mid-1987
Verbum embodies the Number 11 with a receptive, controlled approach in a further exploration of the evolving technology. This issue was produced with ReadySetGo! 3, 1270 dpi Lino imagesetter output and digital color separations. • Features: "Amiga Video" looks at the unfolding possibilities of the animated Amiga. "Painting as Spiritual Discipline" by Jack Davis shares the artist's experiences with Japan's elegant painting program, Mac Calligraphy. "Big Blue Art" by Mike Kelly profiles the world of IBM graphics from the *Verbum* point of view. "Lino Seps" by Mike Saenz explores the new wave of digital color separation, featuring Marvel Comics' new *Iron Man* cover created by Saenz on a an IBM with a Targa board and color separated on the Linotronic (saved *Verbum* $600!). Digital Studies by Australian Mac-artist Malcolm Thain captures the grace of passive and active female forms. • The usual "Gallery" of unusually inspired pieces. • Columns: "The Artist's Toolbox" compares PostScript illustration programs Adobe Illustrator and CricketDraw as well as two font editors and four special effects programs. "Desktop Techniques" by John Baxter looks at parallels between low- and high-tech graphics tools. J.C. Brown initiates *Verbum*'s "New Frontier Products" column, offering capsule descriptions of fitting new software, hardware, and otherware.


VERBUM 88
The fast expanding world of pc creativity:
• Fashion design on the new pcs • Architectural renderings with digital pencils, charcoal, and 3-D tools • PostScript generation of amazing fractals by Tony Smith • Nira tells about making color fine art prints with dot matrix and ink jet printers • Jack Davis explores 3D illustration and the graphic arts • Animated presentations for corporate clout • Erfert Nielson surveys new color output options • "Avant Art On-Line" by Fred Truck, of The Well's Art Com Electronic Network • The Verbum lab experiments with ultra-high resolution scanners • Artistic hypermedia • Lawrence Kaplan's "Hot-Tech" prints • Digital typeface revue • Increasing international coverage, from Japan to Denmark • Continuing and new columns to inform and entertain • More on writing, drawing, and recording and playing music • An explosion of color • Digital media convergence!
LAWRENCE KAPLAN

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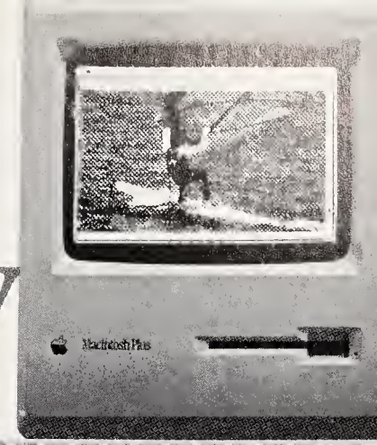

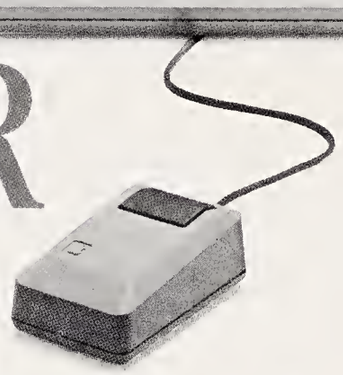

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